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No. 11

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ENERGY

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ELECTRIC POWER

PROBLEMS WITH ATOMMASH CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Feb 80 p 2

[Text] In January the builders and installers at Atommash finished projects worth 9.4 million rubles. This exceeded the level of January a year ago by 14 percent. During the past year the builder and installer organizations were reinforced with people and equipment, enriched by experience and professionally strengthened. The amount of unfinished work decreased.

Therefore, it was expected that the Volgodonskenergostroy trust and its subcontractors would begin this year at a higher work tempo.

In issue No 7 (59) of "SOTSIALISTICHESKAYA INDUSTRIYA at Atommash," a review was published in which January's results were analyzed in detail. As the editorial pointed out, no matter how complicated the tasks facing the builders are, all the prerequisites for successful accomplishment are present. The builders have many resources.

Today, 516 brigades are at work on the construction job. In the last year 125 of them were unable to cope with their tasks. The movement, "Work without Laggards," must be strengthened and developed to provide a base for getting better results. The brigade contract requires serious attention. In the Volgodonskenergostroy trust only a Tenth of the collective had one during 1979. The conditions could not be set up for the rest.

Large losses of working time are still experienced due to idle time, organizational confusion, and poor supplies of materials and equipment. Taking only the last year into account, we see that 20,000 work days were lost. For this reason, 23 million rubles worth of building and installation work went unfinished.

Using the available resources and increasing the tempo and quality of construction is the duty of the Atommash workers. They are committed to this goal by the campaign, "Build Ahead of Time and Produce Ahead of Time," which has received high praise by L.I. Brezhnev, general secretary of the CC CPSU and president of the Presidium of the USSR Supreme Soviet. A letter by Brezhnev to the Don workers evoked great enthusiasm in the builder, installer, and operator collectives.

The newspaper published a selection of announcements under the heading, "Do more, better, cheaper!" Excellent work has been done by the brigade of S. Bryukhovetakiy from SMU-6 [Construction and Installation Administration] of Atomenergostroy. According to the results of the past decade, the brigade of V. Shklyayev from SMU-16 in the Promstroy-1 administration was named the best of those participating in the Lenin labor watch. The carpenters and concrete workers G. Vishnyakova and A. Konovalova from SMU-8 and S. Grigoryana from SMU-15 are right next to the leader.

In the production collectives active preparation is being made for the communist subbotnik on April 19. The subdivisions of Otdelstroy decided to do 10,000 rubles worth of construction and installation work on this day. The brigade of A. Pan'shin from Yuzhstal'konstruktsiya decided to assemble 110 roofing units in honor of the 110th anniversary of Lenin's birth. The other brigades working on conveyor line No 5 have supported this good beginning.

The newspaper reports a Komsomol staff meeting held at Atomash on the supervision of construction and productive forces at the flagship of domestic machine building for atomic energy. A journal of the election campaign is being published.

The report by V. Navozov on the "Cost of Indifference" was published under the title, "Party Life." The head of the tool section of Atomash wrote an article, "Caring for Tools." In letters to the editor, A. Ulesov, a well-known welder and twice Hero of Socialist Labor, wrote "The Experiments Continue." Critical statements in the newspaper were answered by M. Tsvirko, head of Glavzavodspetsstroy, and V. Skopov, head of promUKS Atomash.

A sketch by Shevchenko, "Feats on the Dniepr," was published in honor of the 35th anniversary of victory. It describes the military feats of a veteran of the Great Patriotic War, D.E. Myl'nikov, who now is an engineer instructing cadres in the division of technical instruction of Atomash.

Various types of information are published by the newspaper. Kuz'ma Volgodonskiy prepares from his mail a topical item entitled "Only the Deep Night Knows."

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ELECTRIC POWER

CONSTRUCTION OF ATOMIC HEAT-SUPPLY STATION BEGINS IN GOR'KIY

Moscow IZVESTIYA in Russian 2 Mar 80 p 6

[Article by A. Blokhin]

[Text] The construction of an atomic heat-supply station [AST] has begun in Gor'kiy. It will consist of two reactor units with a total thermal power of one million kilowatts.

In recent years atomic power stations have become as familiar as the usual thermal power plants. Most of the AES are located in the European part of the country where the lack of carbon fuel is most evident. Roughly 80 percent of the energy is consumed in the European part, while Siberia and the Far East share only 20 percent. However, the energy resources are distributed in inverse proportion.

Atomic energy helps to correct this "error" of nature to a certain degree. But the AES cannot solve this problem alone. Only one-fourth of the total volume of energy resources are expended on the production of electrical energy. Much more is spent on generating so-called low-potential heat--heat for houses, enterprises and institutions. And here the use of atomic fuel promises enormous advantages.

The first, large-scale practical step in this direction has been discussed by one of the authors of the Gor'kiy AST project, Igor' Nikolaevich Sokolov, who is the head of a laboratory at the Atomic Energy Institute imeni I.V. Kurchatov.

"The question of the need for atomic boilers has received a simple positive answer. Calculations indicate that atomic fuel is not only competitive with organic fuel but is more advantageous: the production cost of heat generated by atomic heat-supply stations is one-and-a-half to two times lower than the average production cost of using organic fuel."

As always with atomic technology, the designers have paid special attention to the safety and reliability of the system. The engineering measures completely exclude the possibility of radioactivity reaching the outside environment and guarantee that the water which brings the heat of the peaceful atom to urban apartments will not only be safe but fit to drink.

The manner in which this goal is accomplished can be seen in the AST being built in Gor'kiy. First, this plant will produce heat only. This "narrow specialization," in contrast to atomic TETs, greatly simplifies the construction problems. The AST does not need a large amount of water to condense the steam from electric turbines and the construction area needed is very small (which sometimes is decisive under urban conditions).

The atomic boiler will operate at low pressure, so that super-strong materials are not required. To ensure safe operation of the station under any unexpected conditions, the reactor will be placed in a reinforced concrete, risk-insured structure. The reinforced concrete guarantees the integrity of the atomic core of the installation even during a strong earthquake. One load of atomic fuel serves to operate the station for two to three years.

The transmission of heat from the working area of the reactor to the consumers is divided into three isolated sections. The planners have provided for a complete hook-up between the atomic boiler and the present urban heat-supply systems.

Similar stations should be constructed in other cities after the main Gor'kiy AST.

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ELECTRIC POWER

OVERVIEW OF LENINGRAD ENERGY RESEARCH FACILITIES

Moscow PRAVDA in Russian 28 Mar 80 p 2

[Article by A. Dulichev, secretary of Leningrad Obkom CPSU]

[Excerpt] Sayano-Shumenskaya and Zeyskaya GES, Leningradskaya, Kol'skaya, and Beloyarskaya AES, the electric transmission lines above the Siberian taiga and the Ukrainian steppes, the gas-pumping stations of the main pipelines. Dozens of the most important units of the fuel-energy complex in different parts of the country are firmly connected to Leningrad. The enterprises and associations in the city manufacture a significant part of the basic electric power equipment.

The oblast party organization always focuses attention on the problems of strengthening the fuel-energy potential of the country. Great efforts have been concentrated on this most important area. Actually, the results have not been bad. The project of the institutes have become more economical, and the technology used in the workshops is more reliable and productive. The 10th Five-Year Plan has seen the series production of machinery with a unit power of 800,000 kilowatts for thermal electric power plants, the manufacture of equipment for a main unit with 1.2 million kilowatts, the construction of an atomic reactor (Millionnik), hydraulic machinery with a power of 640,000 kilowatts,.... Highly efficient boilers designed to use the coal from the Kansk-Achinsk basin have been constructed. Their metal content has been reduced by 40 percent, the installation rate has doubled, and capital expenditures have fallen by 30 percent. The Zvezda Industrial Association was able to make compact motors with a power of 8,000 to 10,000 hp. Their engine life is higher, while the consumption of gas and oil is lower.

After noting the high efficiency of units made in Leningrad, Comrade L.I. Brezhnev in his address to the November (1979) plenum of the CC CPSU especially emphasized that with the growing requirements of the economy taken into account, all aspects of the energy problem must be thought through again and again. Communists in scientific and productive collectives took this directive as a new and crucial mission of the party. A wide range of questions about the improvement of our fuel-energy base were considered at an obkom plenum and a meeting of the council for economic and social development.

Experience indicates that one can help to solve a big problem only through a detailed examination of the full range of possibilities. However, it is extremely important to concentrate the efforts of collectives on the most fruitful areas for technical progress. Therefore, the Leningrad staff of the Presidium of the USSR Academy of Sciences, which created an inter-departmental coordinating council, NII's, VUZ's, and enterprises developed an over-all program for investigating, designing, and operating modern, economical, and reliable equipment. Looking into the future, the document also foresees a search for new energy sources.

One of the ways of solving the problem posed by the November Plenum of the CC CPSU is to increase the output of machines with higher power and improved technical-economic indicators and to accelerate the development of atomic machine building. The collectives of the Izhorskiy Zavod, Metallicheskiy Zavod, and Elektrosila associations are set up to produce just such equipment. We assume that Leningrad contains the necessary prerequisites to produce the appropriate capacity and to ensure the delivery of a complete energy package: a reactor, a turbine, and a generator with higher total power than at present.

Thermal electric power stations using organic fuel still occupy the leading place in energy production. It is also important here to raise the unit power of the machines and to reduce the consumption of fuel and metal. Theoretically new, gas-vapor plants have been constructed by the research and development association, Central Boiler and Turbine Institute imeni I.I. Polzunov. In economy and versatility they exceed the present equipment used for similar purposes. Work in this direction continues.

Certain advances have also been made in the use of new energy sources. The main contribution in this regard has been made by workers at the Scientific Research Institute of Electrophysical Apparatus imeni D.V. Yefremov and by the workers at Elektrosila. In the eleventh Five-Year Plan the first electric power station equipped with magnetogas-dynamic generators will be put into operation. These devices are more efficient than the equipment at thermal power stations. Along with specialists in the countries that are CEMA members, Leningrad scientists are developing a standardized series of turbogenerators with the world's best technical-economic indicators.

Opportunities for preserving traditional types of fuel and using new types are being sought everywhere right now. Hydrogen is evidently a promising fuel, and the basis for producing it is provided by atomic power stations, where this element can be obtained from water and transported to consumers through pipelines in liquid or gaseous form. Atomic heat-supply stations equipped with Leningrad machinery possess a large economic advantage. For example, the production cost of thermal energy from the Gor'kovskaya AST will be one-half as much as that of gas boilers.

Along with the improvement of the parameters of energy producing equipment, a program is being implemented to devise better energy consumption techniques and technology: electric motors, diesels, systems using secondary resources,

and production with less energy consumption. Thus, the collectives of the principal scientific research institutes--of diesel and fuel devices--together with some enterprises are preparing to manufacture machines with a 3-5 percent lower fuel consumption.

Three-fourths of the energy resources are now used in the European part of the country, while the basic reserves are located in the East, where high-power electric power stations are also being built. How will the energy be delivered to the consuming areas? This problem is becoming more and more important. Research conducted at the Scientific Research Institute of Direct Current and the Polytechnical Institute imeni M.I. Kalinin have confirmed the feasibility of constructing super-high voltage lines--from 750 to 2,500 kilovolts--to transmit high electric currents long distances with minimum losses. For example, when current is sent from the Ekibastuzskaya GRES over a high-power LEP [electric power transmission line], a savings is realized on the output of an electric power station with a capacity of 1.4 million kilowatts.

The requirements of the economy for energy producing machines are growing rapidly. This has placed new and more difficult tasks before the Leningrad machine builders. The bureau of the party obkom has approved the campaign by the workers at the Izhorskiy plant to increase the output of equipment by one million kilowatts without supplementary (unplanned) expenses. It was suggested that all the enterprises should try to increase the production of atomic energy installations: reactors, turbines, generators, high-voltage apparatus, control panels, and LEP technology. This policy will be carried out by increasing unit power, reducing material costs and labor intensity, and by greater specialization. Modern technology and scientific organization of production are to be widely used.

Here is one result of this effort. The metal used in a new reactor--millionnik--is 50 percent lower per kilowatt of power than its predecessor, and its labor intensity is 30 percent lower. Calculations indicate that important progress can be made in industries related to the energy industries. Right now, for example, three-fourths of the needs of the North-West economic region for petroleum are satisfied by the Kirishskiy and Ukhtinskiy petroleum processing plants. One-fourth of the fuel must be delivered by railroad from other oblasts. The growth of the Kirishskiy NPZ [petroleum processing plant] and the improved selection of light petroleum products have allowed the shipments to be reduced to 5-7 percent. The construction of secondary pipeline outlets will free tens of thousands of tank cars.

Or consider another question. It is time to think about setting up a special complex at the Severo-Onezhskiy bauxite deposits. Then the need to ship alumina thousands of kilometers no longer arises. Furthermore, electric power losses are reduced to 800 million kwh per yr; 400-450 million rubles in capital investment are saved; and 90-95 million rubles in operating expenses are saved. The Olenegorskiy Mining and Dressing Combine and the Kol'skaya AES can provide a good productive base for recovering pure iron directly from

ore for use in powder metallurgy. These suggestions by scientists and workers are worthy, in our opinion, of the attention of USSR Gosplan, USSR State Committee on Science and Technology and the USSR Academy of Sciences.

The problems connected with the improvement of the fuel-energy complex, which people in Leningrad are now working on, are complicated and diverse. Progress in this case depends greatly on the skill of party organizations and economic agencies noting and giving timely support to useful initiatives from below and correctly and exploiting really valuable undertakings. The experience of 28 enterprises and organizations in Leningrad in providing high-quality work and reducing the time required for construction of the Sayano-Shushenskaya GES is widely known throughout the country. It has fully justified itself in the installation of other facilities and will be used by us to carry out the over-all programs for energy development. One organization is responsible for each initiative, staffs have been assembled, and the effects of all the participants in the construction of a facility are being coordinated.

The northwest council of directors of associations and organizations in the USSR Minelektrotekhprom is working fruitfully. It is used as a model to set up other territorial agencies to improve the relationships with other industries. Network planning and control is being increasingly used for large-scale orders fulfilled through the participation of hundreds of enterprises in different departments and areas of the country. We suggest that modern methods be applied to the most important energy projects. We place special hopes on the recently formed interdepartmental coordinating council of the USSR Academy of Sciences. It was set up to arrange close cooperation between academic institutions and scientific collectives in ministries and departments, and with the VUZ's of the Northwest economic region. CPSU gorkoms and raykoms have been made responsible for establishing constant control over the fulfillment of the over-all programs, development of technology, utilization of productive capabilities and delivery of equipment to projects.

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ELECTRIC POWER

SHANKHORSKAYA GES CONSTRUCTION CONTINUES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jan 80 p 1

[Article by special correspondent D. Malikov: "The River Is Subdued"]

[Excerpts] Builders at the Shankhorskaya GES in Azerbaijan have spanned the Kura river. This is an important step in building a hydroelectric station.

The damming of the Kura marks the beginning of a new and more intense stage in the construction of the Shankhorskaya hydroelectric power station. The upper arch must be erected this coming spring, requiring almost 200,000 cubic meters of earth. And in a year--1981--the first unit should be producing current.

It is difficult to overestimate the importance of the Shankhorskaya GES for the economy of Azerbaijan and the Transcaucasian republics. The 410 megawatts of electric energy, which will be connected to the Transcaucasian energy system, will significantly improve its efficiency and improve the assured energy supply for the growing industry of Azerbaijan.

The reservoir with a volume of almost three cubic kilometers will irrigate about 75,000 hectares of land in the adjacent agricultural regions, and of course this will improve the productivity of agriculture and cattle raising. The reservoir will also be one of the fish breeding centers.

The volume on Azerbaijan in a twenty-two-volume geographical description of the Soviet Union contains the following line: "The Shankhor environs is a treeless plain with semi-desert vegetation." The book was published in 1971 and still corresponds to reality. In a short time, however, a salutary moisture will come to the desert, and wormwood will be replaced by the white wave of cotton and the emerald of vineyards, and an energy city with the proud and beautiful name of Kura will rise on the picturesque banks of the future reservoir.

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ELECTRIC POWER

BIOGRAPHIC PROFILE OF ACADEMICIAN NIKOLAY BOGOLYUBOV

Sofia ZEMEDEL'SKO ZNAME in Bulgarian 30 Mar 80 p 4

[Text] The not-so-big town of Dubna, on the Volga River, only 128 kilometers north of Moscow, is well known in the world. This town, in the vicinity of Moscow, owes its reputation to one of the vanguards of contemporary science, i.e. the Joint Institute for Nuclear Research. In the first 50 years of our century the development of physics and mechanics, and particularly the large-scale and accelerated pace of research, did require new forms of cooperation. Realizing this necessity, the governments of some of the countries of the socialist community decided to integrate the creative forces of the scientists as well as their material and technological means with the purpose of achieving even more effective development in fundamental research in the field of physics concerning the elementary particles and the atomic nucleus. Thus, the Joint Institute for Nuclear Science was founded in 1956 in Dubna on the basis of the already existing Soviet nuclear physics institutes.

Today the institute in the vicinity of Moscow is one of the largest in the world, where many scientists from 11 socialist countries work together: from the USSR, Bulgaria, GDR, Poland, Hungary, CSSR, Romania, Mongolia, the Socialist Republic of Vietnam, Cuba, and the Democratic People's Republic of Korea. Its special feature is the combination of extensive development of the fundamental knowledge and the immediate practical application of the results of the research work. The associates of OIYaI [Joint Institute for Nuclear Research] are authors of tens of research projects with international recognition and 20 of them have internationally recognized inventions. Hundreds of inventions have been applied in the institute itself.

Since 1965 the progress in the Joint Institute for Nuclear Research in Dubna and its successes have been connected also with the name of its director, the well known Soviet scientist, mathematician, physicist-theoretician and academician Nikolay Bogolyubov. This past Wednesday he was re-elected as director of the institute by a committee of delegates representing 11 socialist countries which participate in the work of the institute.

Nikolay Nikolaevich Bogolyubov was born 21 August 1909 in Nizhniy Novgorod, now Gorky. He was accepted as research fellow at the Academy of Sciences of the Ukrainian Soviet Socialist Republic and later on worked there also at the Academy of Sciences of the USSR. He excelled from an early age in diligence and scientific talent. His scientific work is extensive and thorough. His principal works dwell upon the approximate methods of mathematical analysis, the asymptotic methods in nonlinear mechanics, the theory of the dynamic systems, the quantum field theory, etc. In 1947 he came out with a firm proof of the microscopic theory of super fluidity, he also substantiated the first evidence of the dispersion interrelations in the quantum field theory (1956), and is one of the founders of the theory on superconductivity (1958). The methods developed by academician N. Bogolyubov are applied also in other fields of theoretical physics, for example in the nuclear theory. He has created scientific schools for nonlinear mechanics statistical physics, and quantum field theory.

Recognition for his notable scientific achievements was not late to come. Nikolay Bogolyubov was elected academician at the Academy of Sciences of the Ukrainian Soviet Socialist Republic in 1948 and 5 years later at the Academy of Sciences of the USSR. Since 1963 he has been academic secretary of the Academy of Sciences of the Soviet Union and in 1965 was entrusted with the responsible position of director of the Joint Institute for Nuclear Research in Dubna. N. N. Bogolyubov is also a member of many foreign academic and scientific institutes and organizations (in the People's Republic of Bulgaria, the GDR, Poland, the United States and others).

For his great contributions to Soviet and world science N. Bogolyubov has been awarded the Lenin Prize (1958), the USSR State Prize (1947 and 1953), five Lenin medals, and in 1969 received the title "Hero of Socialist Labor," etc. Although Nikolay Bogolyubov is a very busy man, he has been able skillfully to combine his work of internationally known scholar with active social work. He is a member of several committees of the USSR Supreme Soviet and participates actively in the Pugwash peace movement, which consists of notable scientists and public figures.

As his own practical contribution to peace academician N. N. Bogolyubov has already devoted 15 years of his life as director of the Joint Institute for Nuclear Research in Dubna whose statute reads: "The work of the institute will be fully devoted to peaceful use of nuclear power for the good of mankind." And in fact the history of the Dubna institute confirms the faithfulness of the personnel to this purpose, i.e. OIYaI increases the number of "professions" of the atom for peace.

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ELECTRIC POWER

BRIEFS

TURBOGENERATOR FOR TETS-2--Nizhnekamsk--The first turbogenerator at TETS-2 has begun operating. It has a power of 135 kilowatts. The station provides electric power to the new petrochemical production at the Nizhnekamskneftekhim association and heat for new living quarters in Nizhnekamsk. The builders and assemblers are now working on the next two turbogenerators to be put into service in the new year. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 1 Jan 80 p 3] 9370

UNIQUE TRANSFORMER--A unique autotransformer with a 1,250,000 kilovolt-ampere capacity was put into service ahead of time at the Novo-Bryanskaya substation for long-distance electric power transmission. Current from the Kurskaya AES passes through the giant transformer. A second section of the substation is now being constructed to take the electrical power from the first plant at the Smolenskaya AES. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 80 p 3] 9370

SOLAR ENGINEERING DEVICES--The scientific collective at the Institute of Solar Energy - the main institution in the Solntse research and development association of the Academy of Sciences of the Turkmen SSR - is developing solar engineering devices for various purposes. Here are devices for cooling industrial and apartment buildings, treating water, growing micro-water-plants enriched by albumin, and solar hot-houses with a closed water-circulation cycle for growing citrus plants. [Text] [Moscow PRAVDA in Russian 30 Mar 80 p 3] 9370

INGURSKAYA GES--Zugdidi, Georgian SSR--The last hydroelectric unit is being installed at the site of the Ingurskaya GES. This station is an offspring of the 10th Five-Year Plan. The four units already operating generate two billion kilowatt-hrs of electric power. Georgian builders and assemblers are helped by the workers from Leningrad and Siberia who have experience at the Bratskaya, Krasnoyarskaya, Nurekskaya, and other large GES in the country. Thirty kilometers above the Ingurskaya station, preparations are under way to erect the Khudonskaya GES with a capacity of 750 thousand kilowatts. Then the lights of Tobariges-1 and Tobariges-2 will be turned on. The reservoir system will irrigate thousands of hectares of previously arid land. [Text] [Moscow SEL'SKAYA ZHIZ' in Russian 12 Mar 80 p 1] 9370

NEW TRANSMISSION LINE--A new electrical river was drawn on the electrical power map of the country. Yesterday, the installation of a 750-kilovolt transmission line was completed. It connects the Leningradskaya AES imeni V. I. Lenin with the European electrical power system of the country. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 28 Mar 80 p 1] 9370

HIGH-VOLTAGE TRANSFORMERS--Zaporozh'e--High-power transformers in a new voltage class are being developed at the All-Union Institute of Transformer Building. A high-voltage series of switching transformers is now being planned at the institute. The use of such equipment provides large savings in the national economy. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 80 p 15] 9370

ELECTRICAL POWER IN ARMENIA--Razdan, Armenian SSR--A high-voltage electric power transmission line almost 70 kilometers long has started operating. This energy artery with a capacity of 110 kilowatts will supply the additional current generated by the Razdanskaya GRES to cattle-breeding complexes and food factories on kolkhozes and sovkhoses in the high-altitude Sevan basin. Rapid rates of development are features of electrical power in rural Armenia during the 10th Five-Year Plan. The outstanding growth of industry has helped to increase greatly the economic potential of agriculture in the republic. Now, hundreds of electric power transmission lines feed electrical energy to the settlements, kolkhozes, and sovkhoses with different types of enterprises. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 25 Mar 80 p 1] 9370

ELECTRICAL POWER UNIT--The first electrical power unit with a 500,000 kilowatt capacity is being tested at the Ekibastuzskaya GRES-1. A competition on the principle of a "worker's race" helped the power-equipment builders to increase the rate of work before starting day. The electric power station will have eight units in all. The GRES will be able to operate on cheap Ekibastuz coal, which is mined by the open-pit method. Its power will go to enterprises in Kazakhstan, Siberia, and the Urals. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 24 Jan 80 p 2] 9370

RYAZANSKAYA GRES--Novomichurinsk, Ryazanskaya oblast--The boiler of the fifth power plant at the Ryazanskaya GRES is being installed. Its large-scale sections, which were assembled ahead of time by cranes at a special site, will be delivered to the main building of the second section of the thermal power station. The construction collective has promised to perform 800,000 rubles worth of work in the third quarter. When the unit starts up, the capacity of the GRES, which supplies power to the center of Russia, will reach two million kilowatts. [Text] [Kiev RABOCHAYA GAZETA in Russian 18 Mar 80 p 1] 9370

GAZALKENTSKAYA GES--Charvak, Uzbek SSR--The construction of the Gazalkenskaya GES, which is being erected on the Chirchik, has reached the final stage. At the end of March, the collective of Charvakgesstroy should dam the river, and the first hydroelectric unit should start operating in December. [Text] [Moscow PRAVDA in Russian 19 Mar 80 p 1] 9370

GUSINOOZERSKAYA GRES--Gusinoozersk-- The fourth power plant of the Gusinoozerskaya GRES has been put into service. The first section of the thermal power plant, which has a capacity of 840 thousand kilowatts, has been installed. Now electrical power will flow to the Mongolian People's Republic and to the Erdenet Combine, and will merge into the unified power system of Siberia [Text] [Moscow STROITEL'NAYA GAZETA in Russian 1 Jan 80 p 3] 9370

TRANSPOLAR GES--Noril'sk--The television screens were turned on in the homes in the newest settlement, Svetlogorsk, in Krasnoyarskiy kray, which is located in the polar circle where a hydroelectric power station is being erected on the banks of the Kureyka river. There are no temporary houses in Svetlogorsk since the "tent" period was limited to one polar summer. Within a short time, cosy cottages, a club, a school, a coffee house, and a kindergarten were constructed in the picturesque forest. At the GES site the preparations for erecting a dam are being completed. Another detachment of builders will come here during summer. The Ust'-Khintayskaya GES is providing the power for the construction project; a d.c. transmission line has been extended from it. In several years, the current on this LEP will flow in the opposite direction. The Kureyskaya GES will be connected to the Taymyr electrical network. [Text] [Moscow SELSKAYA ZHIZN' in Russian 26 Mar 80 p 1] 9370

COAL SMOKE FILTER--Yaroslavl'--A new filter is being installed at the Ladyzhinskaya GRES in Vinnitskaya oblast. It has been developed by the Semibratovo Affiliate of the NII for Industrial and Sanitary Treatment of Gases together with specialists at the Semibratovo Experimental Plant for Gas-Treatment Equipment. The filter is designed for the treatment of smoke from boilers operating on coal. The amount of metal needed for its manufacture has been reduced by 30 percent, and it is seen as a general-purpose filter. It can be used in different branches of industry. The result of installing one electric filter comes to 120,000 rubles per year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Feb 80 p 2] 9370

AUTOMATED SOLAR COMPLEX--Ashkhabad--Turkmen scientists have begun testing an automated solar complex that operates completely on solar energy in a shepherders' settlement. Radiant energy freshens the salty ground water and either heats or cools the houses of the shepherd brigades. In the future seven thousand solar complexes will be built in the desert. This will permit a two-fold increase in the number of sheep in the republic. [Text] [Moscow GUDOK in Russian 5 Mar 80 p 1] 9370

MOUNTAIN POWER LINES--Tadzhik SSR-- In the spurs of the Gissarskiy mountain range workers at the Anzob testing station of the USSR Minenergo are carrying out round-the-clock experiments and studying the electrical characteristics of insulation for high-altitude transmission lines and substations [Excerpt] [Moscow EKONOMICHESKAYA GAZETA in Russian No 13, Mar 80 p 15] 9370

NEW SOLAR COMPLEX--Ashkhabad--Turkmen scientists have begun testing an automated solar complex that operates completely on solar energy in a shepherders' settlement. Radiant energy freshens the salty ground water and either heats or cools the houses of the shepherd brigades. In the future seven thousand solar complexes will be built in the desert. [Text] [Moscow IZVESTIYA in Russian 2 Mar 80 p 6] 9370

FAST NEUTRON REACTOR-- Beloyarsk--December 26 was the most exciting day of the passing year at the Beloyarskaya atomic power plant. Here the first atomic fast-neutron reactor in the country with an output of 600,000 kilowatts was outfitted for a long working life. The scientific director of the startup, Yu. Kazanskiy, a worker at the Obninsk Physics and Power Engineering Institute, gave the order to engage the reactor. Instruments recorded the way in which a remote-control handler took a nuclear fuel pellet from a drum. The reactor startup operation, which takes a long time and complicated technology, had begun. Operating experience with this unit has opened up new ways of developing atomic power in this country. Fast reactors are not only able to provide energy, but can also ensure the production of fuel for their own operation. This means that a ton of natural uranium can yield roughly 25-30 times more energy. The collectives of the construction administration of the Beloyarskaya AES and the Tsentroenergomontazh, Uralenergostroy, and Uralelektromontazh trusts had a complicated and difficult path to this labor victory. There were stoppages due to a shortage of equipment for metal construction. The organization of competition on the principle of a "worker's race" effectively eliminated the nascent difficulties. On the day that physical loading of the unit started, 40 construction brigades reported that the Five-Year Plans had been fulfilled. [Text] [Moscow STROITEL'NAYA GAZETA in Russian 1 Jan 80 p 1] 9370

TESTS OF TRANSMISSION LINES--Dushanbe--Each kilometer of the electrical power transmission line with a capacity of 500 kilovolts from the Nureskaya GES to the workshops of the Tadzhik Aluminum Plant costs 30,000 rubles. An optimum design of this line was developed for the builders by the scientists at the Tadzhik Scientific-Research Power-Engineering Section of the USSR Ministry of Power and Electrification. An electric power transmission line 115 kilometers long was examined at the Anzob pass and in a laboratory with a unique pulsed-voltage generator, where thunderstorm discharges of the order of two and one-half million volts can be reproduced. The specialists study all the factors involved in mountain conditions: flashes of lightning, thin air, and sharp temperature drops. The tests have helped the builders choose rational types of supports and the most "enduring" wire and insulation. The recommendations of the Tadzhik specialists were also useful to the designers of the world's first industrial electric power line in the highest present-day class of 1,150 kilovolt lines; the line will be installed in Western Siberia and will pass through the Kuznetskiy Alatau mountain ranges. [Text] [Moscow SOTIALISTICHESKAYA INDUSTRIYA in Russian 16 Feb 80 p 2] 9370

CSO: 1822

ENERGY CONSERVATION

PAVLODARSKAYA OBLAST CONSERVATION PROGRAMS REVIEWED

Moscow *EKONOMICHESKAYA GAZETA* in Russian No 14, Apr 80 p 4

[Articles: "In the Central Committee of the CPSU"]

[Text] The Central Committee of the party reviewed the work of the Pavlodarskaya Oblast party organization with respect to fulfillment of the resolutions of the CPSU Central Committee about saving fuel and energy resources at enterprises and construction projects.

It is noted in the resolution passed that the Pavlodarskaya Oblast party organization, fulfilling the decisions of the 25th party congress, the resolutions of the CPSU Central Committee, and the instructions of comrade L.I. Brezhnev about an accelerated increase in the country's fuel and energy resources and intensifying the struggle for their economical expenditure, has begun to devote more attention to questions connected with solving this important national economic problem.

The oblast committee, city committees and rayon committees of the party have improved somewhat the organizational and political education work for developing the creative initiative of the workers, and the socialist competition for early fulfillment of the set plans, and all-possible saving of material and energy resources. Since the beginning of the five-year plan coal extraction and the output of electric energy have increased in the oblast, and the assignments for a saving of fuel and electric energy have been overfulfilled.

Along with this it was noted in the resolution that the work performed by party, soviet, business, trade union and komсомol organizations of Pavlodarskaya Oblast is still not meeting the tasks defined by the resolution of the CPSU Central Committee about meeting the growing demands of the national economy for fuel and power resources.

The oblast committee, and the Pavlodar, Yermakov and Ekibastuz city committees of the party are slow to reorganize their activity in light of the demands of the November 1979 Plenum of the CPSU Central Committee about strengthening discipline in all sectors of work. They are not carrying

out the necessary control and strict demand for provision by economic leaders of the plan indicators for extraction, production and saving of fuel and energy, for smooth, accident-free operation of enterprises, for more complete and effective utilization of operating capacities. There were large losses of electric power last year at the Yermakov Ferro-alloys Plant, in the Ekibastuzgol' Association and a number of others. At many enterprises and organizations in the oblast the expenditure of fuel is not recorded, and secondary energy resources are not being used satisfactorily. Mismanagement in the expenditure of oil products occurs in certain sovkhozes and kolkhozes.

The oblast, city and rayon committees of the party still have not seen to it that the work for rational utilization of fuel and energy takes on a mass-scale character and becomes the daily concern of each party, trade union and komsomol organization, of the local soviets of people's deputies, and of each labor collective. A number of party committees is not sufficiently activating the work of the party organizations with respect to saving energy. These questions are seldom discussed at party and worker meetings, or regular production meetings.

In political education work, in oblast, city and rayon newspapers, and in radio and television broadcasts still not clearly explained is the national significance of the battle for saving energy resources, and it is not being shown convincingly that successful solution of this important problem depends on the active participation of each collective, of each worker.

In the resolution, attention is directed to the fact that the leaders of the USSR Ministry of the Coal Industry, the USSR Ministry of Energy, and local economic, party and soviet agencies are violating the schedules and comprehensiveness of development of the Ekibastuz coal basin, they have allowed a lag in the introduction of capacities for producing electric power, for housing and facilities for social, cultural and domestic purposes, and they are not giving due attention to the creation of the necessary production and daily living conditions for the workers.

The CPSU Central Committee has obliged the Pavlodar oblast committee of the Communist Party of Kazakhstan, guided by the decisions of the November 1979 Plenum of the CPSU Central Committee, the statements and conclusions contained in the speeches of comrade L.I. Brezhnev regarding fuel and energy problems, to work out and implement additional measures for a radical improvement in the organizational and political work directed at an accelerated increase in the extraction of coal, in the production of oil products, electrical and heat energy, and for rational utilization of these resources at enterprises, construction sites and in organizations in the oblast.

The CPSU Central Committee especially stressed that realization of the party's policy for saving energy in all units of industrial

and agricultural production, construction, transport, and municipal economy is the most important economic and political goal of all party, soviet, economic, trade union and komsomol organizations. It is necessary to organize among the workers a truly mass movement for thrift, to raise the significance of these questions in the evaluation of economic performance, in summarizing the results of competition, and in the moral and material incentives for labor collectives, blue-collar and white-collar workers.

It was proposed that the Pavlodar oblast committee, the city committees and rayon committees of the party perform organizational and educational work more to the point and more insistently, that they use stricter control over absolute fulfillment of the decisions of the party and government regarding an increase in the saving of fuel and energy resources, that they react more sharply to cases of mismanagement during the expenditure, transport and storage of these resources. The goal is for each enterprise, construction project and organization to work out and consistently translate into reality concrete measures for improvement of technological processes, for introduction of economical energy equipment, new designs and progressive materials, insuring a significant improvement in the end results with respect to lowering the specific expenditures of all types of energy for product output.

The CPSU Central Committee has obliged the leaders of coal and energy enterprises of Pavlodarskaya Oblast to provide unconditional fulfillment of the 1980 plan assignments for extraction of coal, production of electrical and heat energy, fuller utilization of operating capacities, elimination of unproductive downtimes of equipment, maximum extraction of fuel from the earth and an improvement in its quality, and reduction in the downtimes of railroad rolling stock.

The attention of the Pavlodar oblast committee, city committees and rayon committees of the party was directed to the necessity of intensifying work with the primary party organizations and party groups, of increasing the role and responsibility for realization of measures regarding a saving of fuel and energy. It was recommended to increase the activity of the commissions for control over the expenditure of energy resources, to attract public organizations and people's controllers more widely to this work, and regularly to review the state of affairs at party and worker meetings. It was recommended more actively to direct all the means of propaganda and mass political work in order to train workers in the spirit of thrifty expenditure of fuel, electrical and heat energy at each work site and in daily life, in exemplary discipline and high responsibility for the matter entrusted. It is recommended to raise the level of visual agitation, and the effectiveness of statements in the press, radio and television with respect to these questions.

The CPSU Central Committee especially directed the attention of economic leaders to bringing secondary energy resources into production more fully.

This is one of the most important and cheap sources of replenishing the country's fuel-energy balance. It was proposed for the heads of ministries and enterprises to take the necessary measures for more rapid and complete utilization of this effective reserve. Specific assignments are to be established for each enterprise significantly to cover the needs for heat and electric energy at the expense of its own resources, using the positive experience in this matter accumulated at a number of enterprises in ferrous and non-ferrous metallurgy, the chemical industry and certain other sectors.

The CPSU Central Committee has called on the collegiums of the USSR Ministry of Power and Electrification, the USSR Ministry of the Coal Industry and ministers comrades Neporozhnyy and Bratchenko personally to increase attention to the development of the Ekibastuz fuel and power complex, to take the necessary measures for putting electric power plants, electric power lines, new coal mines, and facilities for housing and cultural and domestic use into operation on time, and to strengthen construction and installation organizations. The creation in the first place of the necessary housing and cultural and domestic conditions for the builders should be considered the priority task of the leaders of the ministries, the Ekibastuzugol' Association, the Ekibastuzshakhtostroy Combine, the Ekibastuzenergostroy Trust, and also local party and soviet agencies.

The CPSU Central Committee has instructed the Central Committee of the Communist Party, the Councils of Ministers of the union republics, kray, oblast, city and rayon committees of the party, and executive committees of Councils of People's Deputies to review the course of fulfillment of the resolutions of the CPSU Central Committee and the USSR Council of Ministers with respect to a saving of energy resources and providing the national economy with fuel, as well as the organizational and technical measures developed locally regarding these problems, and to take additional measures for their realization. The efforts of party, soviet and economic agencies even now should be aimed at implementation of the complex of measures for preparing enterprises and organizations in industry, construction, transport, the communal and domestic economy for steady operation in the 1980-81 fall-winter period. It is important to create opportunely the necessary reserves of fuel, raw material and supplies, and to complete repair and other necessary jobs on time.

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FUELS

GAS INSTITUTE DIRECTOR OUTLINES MAJOR PROJECTS IN 1980

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 p 17

[Article by A. I. Gritsenko, director of the All-Union Scientific Research Institute of Natural Gas: "Building up Scientific Potential"]

[Text] The collective of the institute, carrying out the comprehensive program to solve the basic scientific-technical problems of development of the gas industry, performed a number of scientific studies to insure accelerated development and a rise in the efficiency of the sector.

All of the scientific studies were performed by various laboratories and divisions of the institute working together with extensive involvement of specialists of other scientific and planning institutes of the sectors and other ministries and departments. The institute is broadening its scientific-technical cooperation with the CEMA countries and with Yugoslavia, West Germany, and France.

The November 1979 Plenum of the CPSU Central Committee posed a number of key challenges for further intensification of the development and improvement of the gas industry. To solve these problems VNIlgaz [All-Union Scientific Research Institute of Natural Gas] must do a great deal of work in 1980, the concluding year of the 10th Five-Year Plan, in conformity with the comprehensive programs that have been laid out for development of the sector. We must work out a Master Plan for development of the gas industry until the year 2000 and scientific-technical measures to accelerate development of the Urengoy and Yamburg fields, create large gas extraction and gas chemical complexes based on the raw materials of Southeastern Turkmenistan and the Astakhan' field, and intensify geological exploration in the shelf zone of the seas and oceans.

In the field of gas transportation we must incorporate new transportation technology with a working pressure of up to 120-kilogram force per square centimeter using pipe 1,420 millimeters in diameter with

factory internal and exterior coating, and take part in building powerful compressor plants for trunk gas pipelines based on automated modular gas pumping aggregates with gas turbine drive of up to 25,000 kilowatts and electric drive with up to 12,500 kilowatts. In addition, we are to work up and introduce scientific-technical steps to reduce fuel-energy and other expenditures of gas for the needs of the sector itself by rebuilding existing gas pipelines, incorporating new technology and means of repairing pipeline systems, and replacing gas pumping units and improving their economy.

Work will be expanded this year on formulating a reserve gas supply complex for the country and on the use of nontraditional energy sources, including geothermal energy, the energy of the zone of anomalously high pressures, weakly permeable productive strata, and others. Serious attention will be given to building and introducing modern means of environmental protection and preventing contamination of the surrounding area in regions of gas industry activity.

Installations to process condensate and produce engine fuels are to be introduced in 1980 at the Naip and Urengoy fields.

The institute is attaching special importance to solving questions which until now have not received proper attention: working out recommendations on guided searches of gas fields in the European part of the USSR; exploitation of fields during the period of decreasing recovery, substantiation of launching times and capacities of booster compressor plants, and determining the rate of decrease in gas recovery and final gas yield coefficient; formulating reliable designs for producing wells in permafrost conditions.

Solving these problems will provide a foundation for successful fulfillment of the plans of subsequent five-year plans.

For the collective of our institute this is a very important year. By the end of the year we must complete work on the institute's transition to economic accountability for the design, development, and introduction of new equipment based on schedule orders. Annual topical plans of scientific research, design, and technological organizations and plans for introduction of new equipment in the sector will be shaped in conformity with these schedule orders.

In this connection we are working toward further improvement of the system of planning, monitoring, and evaluating the level of development work and checking on fulfillment of intermediate stages of schedule orders with defense of particular points of the comprehensive programs at the Learned Councils, the problem councils, and leading production associations.

In the concluding year of the 10th Five-Year Plan, marked by the glorious 110th anniversary of the birth of V. I. Lenin, the collective of our institute will apply all its efforts toward good, timely solutions to the basic scientific-technical problems of the sector and thus will make a worthy contribution to raising the efficiency and reliability of gas supply to the national economy.

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FUELS

MOSCOW GAS TRANSPORTATION ASSOCIATION CONTINUES TO BE OUTSTANDING

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 pp 18-19

[Article by Anatoliy Ivanovich Safronov, director of Mostrangaz:
"Mostrangaz - Standard Bearer of the Sector"]

[Text] From the Editors

Mostrangaz, formerly the Moscow Administration of Trunk Gas Pipelines, was formed in 1946 on the basis of the USSR gas industry's first pipeline, from Saratov to Moscow. It had an annual productivity of 500 million cubic meters.

At the present time Mostrangaz, whose full name is the Moscow Order of Lenin Production Association for the Transportation and Delivery of Gas, is one of the largest gas transportation enterprises in the Unified Gas Supply System of the USSR.

More than 100 billion cubic meters of gas was pumped through the steel arteries of the association in 1979.

The association includes 14 line production administrations, three underground gas storage points, six construction and repair organizations, an office for capital repair of gas wells, and a directorate of pipelines under construction.

The system today has about 300 gas distribution stations supplying gas to more than 250 cities, communities, and large industrial enterprises in the European part of the country and the Moscow industrial center.

The system operates 24 compressor plants with 42 compressor shops in which 295 gas pumping aggregates with a total installed capacity of more than 1 million kilowatts are mounted.

The system has a total of about 3,400 kilometers of cable communications lines and more than 3,000 kilometers of overhead communications lines.

The association operates 16 regional remote control systems and has launched a central remote control system called the TM-100.

Most of the compressor plants have centralized monitoring and control systems.

The association has introduced the first information-computing complex in the domestic gas industry. It provides monitoring, analysis, and calculations of optimal gas transmission regimes, long-range planning and forecasting of gas consumption, calculations of energy expenditures to transport gas, and other technological calculations. The Public Scientific Research Institute of Long-Range Gas Transportation has been functioning within the association for roughly 20 years. It combines the efforts of engineering-technical personnel, employees, and innovative workers in the struggle to continue improving gas transportation machinery and technology.

The hard work of association employees has received high praise many times.

In the last six years the collective of Mostrangaz has been awarded the challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Central Committee of the All-Union Leninist Komsomol four times for achieving excellent results in fulfillment of state assignments and socialist obligations.

During the Ninth and 10th five-year plans the association has been awarded the challenge Red Banner of the Ministry of the Gas Industry and Central Committee of the Trade Union of Workers of the Petrochemical, Petroleum, and Gas Industries for fulfillment of quarterly plans 20 times.

The editors asked Anatoliy Ivanovich Safronov, manager of the association, to talk about the problems the association is working on, the difficulties its collective is encountering, and their plans for the concluding year of the 10th Five-Year Plan.

[Comment by Anatoliy Ivanovich Safronov, director of Mostrangaz]

Carrying out the historic decisions of the 25th CPSU Congress, our collective is working hard to raise the efficiency and quality of work by all elements of the association.

In the first four years of the 10th Five-Year Plan the average annual growth in gas transportation for our association averaged more than 13 percent. In 1978 we delivered 80.7 billion cubic meters of gas to customers, which was 44 percent higher than the volume transported in 1975. While the volume of commodity gas is growing, the increase in personnel employed in gas transportation is rising only slightly. In the

first four years it was 3.6 percent. Each year labor productivity increases 10-11 percent. The amount of gas transported per employee of the association in 1979 was 50 percent greater than the 1975 level.

Labor productivity in the association is growing as a result of the increase in the volume of gas being transported, introduction of mechanization and automation of production processes and progressive forms of labor organization, improving worker training and providing advanced study opportunities, and strengthening labor and production discipline.

The association has introduced all normative documents ratified by the Ministry of the Gas Industry setting norms for numbers of workers and engineering-technical personnel.

The introduction of standard plans for organization of work positions in brigades, shops, and other structural subdivisions made it possible to improve the organization of labor for 1,900 employees of our association.

Introduction of the Shchekino method made it possible to eliminate 159 staff positions and raise the amount of the monthly supplementary payment by an average of 16 percent of the wage rate. The economic impact from this measure was 95,000 rubles per year.

In recent years we have begun to employ norm-controlled assignments, and more than 1,150 employees of the association now work on this basis. More than 900 efficiency workers take part in technical creativity, producing 1,100-1,200 efficiency proposals a year, of which 1,050-1,100 are introduced. The economic impact of this work has been more than 700,000 rubles since the beginning of the five-year plan.

Socialist competition, which is very helpful to the collective in fulfilling its assignments, has developed broadly in the association.

Among the best subdivisions during this five-year plan are the Ostrogozhsk, Serpukhov, Voroshilovgrad, Noginsk, and Rostov line production administrations, the Moscow underground gas storage facility, and mobile mechanized columns Nos 4 and 2.

One of our important jobs is constantly improving the condition of trunk gas pipeline structures. During the 10th Five-Year Plan the corrosion protection of pipelines has been improved by 3.2 percent, 134 new cathode protection stations have been built, and 1,358 anode grounding stations have been replaced.

The personnel of the compressor plants have done a great deal to re-line the plants to deliver gas to the south. The control and measuring equipment and automation devices at many stations have been modernized and the working reliability of the units improved. Underground gas

storage capacities have increased through modernization of existing facilities and introduction of new ones.

In the last three years 146 kilometers of gas pipelines have been repaired, 5,945 square meters of housing has been introduced, an industrial base was built and put into use for the Rostov mobile mechanized column, and work is finishing on construction of the Kaluga industrial base.

The association is devoting special attention to conserving fuel and energy resources.

Measures to conserve gas, energy, and lubricants envision the following:

1. daily analysis of the efficiency of all segments of the pipelines and steps to insure optimal parameters;
2. optimal loading of gas pumping aggregates, reducing the time they run on idle, and increasing the efficiency of the units;
3. preventing gas leaks and flaws in pipes and eliminating them when necessary; systematic valve testing and improvement of electrical and chemical means of corrosion protection;
4. reducing the number of well blowouts at underground storage facilities by using surface-active substances and agents;
5. monitoring the work of gas expenditure gauges;
6. using recycling boilers to heat work positions.

Saving fuel and energy resources is considered a paramount task at the association. Progress in this matter has enabled the collective to become a leader in competition and win the challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Central Committee of the All-Union Leninist Komsomol for the last three years. At the same time Mostransgaz has been entered on the Board of Honor at the Exhibition of the Achievements of the USSR National Economy.

At the present time the collective of the association is carrying out activities which we have based on a critical analysis of existing shortcomings in our work and the search for ways to overcome them.

Many problems that complicate fulfillment of the program for continued development of the gas transportation association will be resolved during this planned work, but some of the difficulties require deeper consideration and highly effective action.

In the first four years of the five-year plan the association did not meet its plan for incorporating capital investment and launching fixed capital, which was a result of poor work by contracting organizations as well as other factors. As an example, construction on the complex of buildings for the vocational-technical school in Semiluki was begun in 1975. Each year the Voronezh construction-installation administration of the RSFSR Ministry of the Building Materials Industry incorporates less than 25 percent of the allocated capital investment, and moreover they use client help too. State Vocational-Technical School No 24, for whom the complex is being built, still cannot see when construction will be finished.

Equally poor construction work is being done on branch pipelines by the Mosgazprovedstroy [Moscow Gas Pipeline Construction] Trust, the Soyuzgazpetsstroy [USSR Special Gas Construction] Trust, and other organizations of the Ministry of Construction of Petroleum and Gas Industry Enterprises.

Quite often we, as the clients, do not have a full set of plans and estimates for projects that are included in the plan of construction. This happened in 1978-1979 during the construction of compressor plants on the Petrovsk - Yelets pipeline and is being repeated today in construction of compressor plants on the Gryazovets - MOK [possibly Moscow Oblast complex] pipeline.

In these cases we, the clients, are very much to blame, but the Giprogazsentr [possibly State Planning Institute for Gas Industry Construction in the Central Zone] should be held even more strictly responsible.

The contracting organizations that belong to the association are not working consistently. Lack of preparation at construction bases, unsatisfactory material-technical supply, and poor labor organization are the reasons.

The volume of work in 1980 for all types of activity at the association is increasing significantly, which creates significant strain in the plan.

To raise the volume of gas transportation by 13 percent this year means to deliver more than 105 billion cubic meters of gas to customers, while also increasing the volume of gas pumped into storage.

To launch two new trunk pipelines, the Gryazovets - MOK and Petrovsk - Yelets lines, as well as a large number of production and housing-domestic facilities this year means to triple capital investment and increase the introduction of fixed capital seven times.

In our contracting activities we must strive for stability in performing work, specializing the contracting organizations in particular functions, establishing all essential production bases, and improving the organization of labor and mechanization of work both in new construction and during capital repair.

In response to the resolutions of the November 1979 Plenum of the CPSU Central Committee and the points and conclusions in the speech given at the Plenum by General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet comrade L. I. Brezhnev, and in honor of the 110th anniversary of the birth of V. I. Lenin, our collective has assumed socialist obligations whose goal is to fulfill the assignments of the 10th Five-Year Plan ahead of schedule, insuring optimal economic indexes of work by all elements of the association.

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FUELS

GAS INDUSTRY EQUIPMENT REPAIR CHIEF RECOUNTS SUCCESSFUL OPERATION

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 p 16

[Article by I. I. Sokolovskiy, director of the Soyuzgasenergozemont Production Association: "The Main Thing Is Highly Organized Labor"]

[Text] Uninterrupted gas supplied to customers depends significantly on the reliability of the compressor plants. For this reason the collective of the Soyuzgasenergozemont [USSR Gas Energy Repair] Production Association faces important challenges. As we outline ways to meet them, we must use the positive working experience that has been accumulated during performance of assignments in past years.

In the first four years of the 10th Five-Year Plan personnel of Soyuzgasenergozemont performed capital repair on gas pumping aggregates; more than 60 units beyond the plan were repaired. In this period a significant amount of work was done to set up a system in the sector to supply gas transportation enterprises with spare parts for industrial equipment. The association has begun establishing a network of territorial depots operationally linked to gas transportation enterprises.

In the last two years we have successfully incorporated new types of work. In 1979, for example, association personnel performed launching and adjustment work at the Bogandinskiy and Turtasskiy compressor plants of the Urengoy — Chelyabinsk gas pipeline and installed gas pumping units at compressor plants of the Kysyk — Kamys, Makat, Inderborg, and fourth phase of the Central Asia — Central Zone pipelines, among others.

Workers of the association take a fully responsible and creative attitude toward performance of tasks assigned by the Ministry of the Gas Industry. Last year, for example, it was necessary to build and launch the Chmi and Kvesheti compressor plants on the Ordzhonikidze — Tbilisi gas pipeline as quickly as possible to supply fuel to enterprises and populated points of the Transcaucasian republics.

Working under difficult conditions, the collective of the Soyuzgasenergozemont Association installed four GPA-Ts6.3 gas turbines at these compressor plants.

Aware of how important it is to prepare for such jobs, the managers of the association devoted considerable attention to this aspect of the work.

A headquarters was formed for installation work at these sites. Services of the association devised plans for the work with due regard for local conditions. The installation jobs were assigned to the best installation brigades headed by I. F. Senin and M. G. Dan'kin.

Ample technical equipment and precise organization of the labor process played a significant part in accelerating the completion time of installation work. The installation brigades set up a total accounting of working time, which made it possible to raise the labor productivity of workers substantially during the launching period. Payment was made by unified orders for completion of stages of work.

The association's experience in organizing socialist competition among labor collectives made it possible to find the most effective forms of working rivalry between brigades installing industrial equipment. Totalling results on a regular basis, providing broad publicity, and correctly combining material and nonmaterial stimuli encouraged the workers to take a creative approach to performance of their jobs.

Timely and exact performance of planned activities and a high level of labor productivity and organization enabled the brigades to perform their assignments in installing the gas pumping unit 18 days ahead of schedule.

While making use of all progressive organizational forms accumulated through work experience and generated by socialist competition, we should not forget the reserves available in every labor collective, at any work position.

The main thing now is for every worker to strive to raise labor productivity, work efficiency and quality, and the level of organization and discipline.

Our Motherland has greeted the new year with a patriotic movement, the competition to celebrate the Lenin jubilee in a worthy manner. The collective of the Soyuzgasenergozemont Production Association has become actively involved in the competition in order to celebrate the 110th anniversary of the birth of V. I. Lenin with new labor successes.

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FUELS

OVERVIEW OF GAS INDUSTRY TODAY, PROBLEMS, CHALLENGES

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 pp 4-9

[Article by S. A. Orudzhev, minister of gas industry: "The Challenges of Gas Industry Workers in 1980"]

[Text] The November 1979 Plenum of the CPSU Central Committee emphasized the need to insure continued dynamic and proportional development of domestic production and consistent implementation of the policy of raising the efficiency and quality of work in all elements of the national economy.

All our country's sociopolitical life today and all the multifaceted creative activity of the Communist Party and Soviet people are taking place under the enormous mobilizing and inspirational influence of the resolutions of the November 1979 Plenum of the CPSU Central Committee, which was an important milepost in the struggle to carry out the majestic socioeconomic program of the 25th CPSU Congress.

In his talk at the Plenum, a talk that was exceptionally persuasive in terms of principled assessments and thoroughly substantiated conclusions, General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Comrade Leonid Il'ich Brezhnev presented a comprehensive analysis of the results of development of the Soviet economy in the first four years of the five-year plan and our plans for the concluding year. He clearly outlined the key problems of economic and cultural development, disclosed the causes of existing difficulties and shortcomings with Leninist straightforwardness and exactitude, and pointed out ways to overcome them.

The Plenum in its decree stressed the need to concentrate efforts on insuring fulfillment and overfulfillment of the assignments of the final year of the five-year plan and to continue raising the efficiency and quality of all work. Special attention here was directed to

raising labor productivity, accelerating the intensification of public production on the basis of scientific-technical progress, improving economic planning and management, and development of the fuel-energy complex and other economic sectors by every means. The problems of improving capital construction, raising the return on fixed productive capital, efficient and economical use of raw materials, fuel, and all other resources, strict compliance with plan, production and labor discipline, and strengthening personal accountability for assigned jobs are subjects of special party concern.

Practical implementation of the resolutions of the Plenum is raising the country's economy, science, and culture to new heights. It will promote more harmonious development of the national economy and insure continued growth in the material well-being of the working people and bolstering of the industrial might of our socialist Motherland.

In his talk at the November 1979 Plenum of the CPSU Central Committee summarizing the results of constructive work by Soviet people, Leonid Il'ich Brezhnev took note of the significant growth of the fuel-energy complex and posed a number of important challenges for its further development. In the last 15 years alone the production of electricity and extraction of petroleum (including gas condensate) has almost tripled, while gas extraction has more than quadrupled.

We may observe with satisfaction that the gas industry is one of the key sectors of the fuel-energy complex and, thanks to the constant concern of the CPSU Central Committee and Soviet Government, it is developing in full conformity with the decisions of the 25th CPSU Congress.

On the threshold of the concluding year of the 10th Five-Year Plan Leonid Il'ich Brezhnev congratulated the country's gas industry workers on a new labor victory. On 26 December gas extraction reached a total of 400 billion cubic meters. Thus the lower level of nationwide gas extraction envisioned by the document "Basic Directions of Development of the USSR National Economy" for the end of the five-year plan was attained one year early. Gas extraction in 1979 was raised to 406 billion cubic meters; 2.5 billion cubic meters of gas was extracted beyond the state plan and supplementary assignment and the annual increase in volume of 34.5 billion cubic meters was the largest in the history of our domestic gas industry.

In the first four years of the current five-year plan 28 billion cubic meters of gas beyond the plan assignments was extracted and 370 million rubles of above-plan output was sold. The volume of industrial output increased 49.5 percent while labor productivity rose 37.9 percent and more than 400 million rubles of profit beyond the plan was obtained.

The largest territorial production complex is developing rapidly in Western Siberia. In 1979 gas extraction there reached 121 billion cubic meters, more than triple the 1975 level. The Medvezh'ye field reached projected capacity one year ahead of schedule, and industrial development of the Urengoy gas field has begun on a large scale.

The large gas chemical extraction and refining complex based at the Orenburg gas condensate field is now formed. In the first four years this complex extracted and refined 155 billion cubic meters of gas and produced 3.5 million tons of elementary sulfur and millions of tons of condensate. The collective of the Orenburggazprom [Orenburg Gas Industry] Association has produced 12 billion cubic meters of gas beyond the plan in the first four years of the five-year plan.

With participation by other CEMA members the Soyuz gas transportation system, the largest in Europe, has been built and put into operation between Orenburg and the Western Border of the USSR.

The Shatlyk and other new gas fields have been opened up in Turkmenistan. The Turkmengazprom [Turkmen Gas Industry] Association overfulfilled its gas extraction assignment for the first four years of the five-year plan by 11 billion cubic meters. Ukraine gas industry workers produced 7 billion cubic meters of gas beyond their assignments in the first four years, and the gas workers of the Komi ASSR, Kuban', Yakut ASSR, and Noril'sk region overfulfilled their plan assignments.

A vast program of capital construction has been carried out. The total volume of capital investment in development of the gas industry in the first four years was 17 billion rubles. Workers have launched 147 compressor plants and more than 24,000 kilometers of gas pipelines, including such major transportation systems as the line from Medvezha'ye through Ukhta, Torzhok, and Gryazovets to Leningrad, from Nizhnyaya Tura through Perm' and Kazan' to Gor'kiy, and from Urengoy to Chelyabinsk. These lines are built of large-diameter pipe with pressures up to 75 kilogram-force per square centimeter. The capacities of underground gas storage facilities have tripled.

The scale of development of the domestic gas industry and its production-economic potential are illustrated by the following figures: the industry today has about 250 gas and oil fields in industrial operation; gas refinery capacities are 62 billion cubic meters; the total length of trunk gas pipelines exceeds 125,000 kilometers; the total power of compressor plants is 15 million kilowatts. The fixed productive capital of the sector has reached a value of 33 billion rubles.

Behind these totals is the heroic labor of hundreds of thousands of employees of the gas industry, construction and installation workers, machine builders, scientists, planners, and designers. The rapid growth of our sector was made possible by broad practical introduction

of current advances in the fields of science, engineering, and technology, the significant organizational and political work of party, trade union, and Komsomol organizations, the development of Socialist competition, and the constant attention and enormous concern of the CPSU Central Committee and Soviet Government for development of the gas industry.

About 4,000 gas industry workers have received government awards in the current five-year plan. The Orenburggazprom, Nadyngazprom [Nadym Gas Industry], Mostransgaz [Moscow Gas Transportation], Ukrburgaz [Ukrainian Gas Drilling], and Shatlykgazdobycha [Shatlyk Gas Extraction] Associations, the Vuktyl Gasfield Administration, the Druzhkovka Gas Equipment and Valve Plant, the Petroleum and Gas Extraction Administration imeni XXII S'yezda KPSS, and the VNIPIgaz [All-Union Scientific Research and Planning Institute of Gas Industry] have frequently won challenge Red Banners of the CPSU Central Committee, USSR Council of Ministers, AUCCTU, and Central Committee of the All-Union Leninist Komsomol based on the results of All-Union socialist competition to raise work efficiency and quality and successfully resolve key scientific-technical problems.

We have done a great deal toward carrying out the program of development of the gas industry developed by the 25th CPSU Congress. A good foundation has been laid for accomplishing the national economic objectives of 1980. While giving due credit for past accomplishments, attention must be focused on a careful critical analysis of all our economic activities from the standpoint of the high demands made by the November 1979 Plenum of the CPSU Central Committee. We must outline concrete steps toward fuller and more efficient use of the economic potential created in the sector and identify ways to accomplish plans successfully from the first day of the new year, a year of special political significance.

1980 is not only the concluding year of the current five-year plan, but also the foundation on which the next five-year plan will be built. This is the year in which the Soviet people and all progressive humanity are preparing to celebrate a portentous anniversary, the 110th anniversary of the birth of V. I. Lenin. This is the year of vigorous preparation for the upcoming 26th Congress of the Communist Party of the Soviet Union. It is from this standpoint, and with a sense of particular responsibility to the party and the people, that we, employees of the gas industry, should approach the evaluation of work done and challenges facing us now. We do have large, difficult challenges; there are many unsolved problems and tight spots.

The state plan of economic and social development of the sector for 1980 is extremely demanding. The volume of industrial production is to be raised to 3.8 billion rubles with a profit of 2.6 billion rubles. We must incorporate 4.5 billion rubles of capital investment and build 5,000 kilometers of gas pipelines, 29 compressor plants, seven gas preparation installations with a total capacity of 43 billion cubic

meters, and 584 wells, insuring the launching of fixed capital worth 4.1 billion rubles. Plans envision the construction of housing with a total area of 560,000 square meters to significantly improve the housing conditions of the working people.

The enterprises of Glavmorneftegaz (possibly Main Administration of Offshore Petroleum and Gas Extraction) will do a great deal. The installation crane ship Azerbaijan with a capacity of 2,500 tons is scheduled to be launched in the Caspian, along with the first semisubmerged drilling platform and a cable and hose ship. A large program will be carried out there to accelerate industrial launching of the Oilfield imeni 28 Aprelya and to build underwater oil pipelines and condensate pipelines.

Given the intensity of the 1980 plan the slogan of all our work should be to raise the return of field productive capital and conserve labor, raw material, fuel-energy, and financial resources by every means.

A key problem in the plan for this year is timely launching of gas recovery capacities in the northern part of Tyumenskaya Oblast and the gas pipelines associated with them. Plans envision raising the extraction of natural gas there to 148 billion cubic meters, an increase of 37 billion cubic meters.

The first thing necessary to meet this challenge is to launch such gas transportation systems as the Urengoy - Chelyabinsk line which crosses rivers and has 19 compressor plants, the Chelyabinsk - Kuybyshev - Petrovsk line (1,250 kilometers); the Petrovsk - Novopskov line (600 kilometers), and the Petrovsk - Yelets line (608 kilometers) with a total of 17 compressor plants.

Working with the Ministry of Construction of Petroleum and Gas Industry Enterprises we have developed a detailed plan of work to launch these projects. Accomplishment of this plan in detail at the scheduled time and careful checks on performance are the paramount objective of gas industry and construction workers.

In his talk at the November 1979 Plenum of the CPSU Central Committee Leonid Il'ich Brezhnev, speaking of improving and raising the efficiency of the country's fuel-energy complex, pointed out the need to increase the rate of gas extraction in Western Siberia even more determinedly. The Ministry of the Gas Industry has developed and begun implementing a comprehensive program for further development of gas extraction in this region.

Concentrating our efforts on the 1980 challenges, we can see reserves and opportunities that are still not being used but must be put into use. By no means have all enterprises taken a decisive turn in the direction of improving quality, raising labor productivity, achieving

better final results, and maintaining strictest plan, production, and labor discipline.

In the first 11 months of 1979 15 industrial enterprises failed to fulfill plans for sale of output and 17 did not fulfill plans for raising labor productivity. The prime cost of output went up at 12 enterprises in the industry, and 120 of the total number of enterprises in the sector failed to fulfill profit plans.

The Soyuzuzbekgazprom [USSR-Uzbek Gas Industry] Association has fallen significantly behind and did not handle its five-year plan assignment or even its adjusted annual plans.

To correct this situation the ministry has developed and is carrying out a system of supplementary steps to launch new gas fields and gas refining capacities and build special higher-strength gas pipelines to transport sulfur-containing gas in order to use it directly at large power plants in Uzbekistan. The management of all enterprises and organizations in the republic has been concentrated in a single body, Soyuzuzbekgazprom, in order to strengthen management of the gas industry organizationally.

The situation there, however, continues to be strained. The association falls short in gas production every day. The Marabek Refinery works irregularly with large losses of expensive chemical agents. In view of the high level of readiness of the two new industrial units of the second phase of the refinery with a total capacity of 3 billion cubic meters a year, the managers of Soyuzuzbekgazprom must take urgent steps to see that the plant immediately begins refining 100-102 million cubic meters of gas a day.

A key project of this association is to bring the Shurtan gas field into production in the third quarter of 1980 and launch the 430-kilometer gas pipeline from Shurtan to the Syrdar'inskaya State Regional Power Plant. Work on this complex has already begun and all necessary pipe and equipment has been delivered to the site. Field operations workers, drillers, planners, and construction workers of the Ministry of Construction of Petroleum and Gas Industry Enterprises must apply maximum efforts to launch this crucial project ahead of schedule. This would make it possible to receive an additional 1.5 million cubic meters of gas beyond the plan there in 1980.

Major shortcomings and losses are also occurring at the Kaspomorneftegazprom [Caspian Offshore Petroleum and Gas Industry] Association. This association did not fulfill its assignment for the first four years of the five-year plan with respect to recovery of oil and condensate, primarily because of a serious lag in drilling work and low labor and production discipline. In recent years the volume of drilling work and rate of drilling at the association have dropped,

while time losses from accidents and downtime per thousand meters of drilling have increased an average of 30 percent. Violations of industrial well operating conditions, accidents, and uncapped gushers have become more frequent and the practice of flagrantly distorting records and reports of output produced has taken root.

The collectives of the Orenburggazprom, Turkmengazprom, and Komigazprom (Komi ASSR Gas Industry) associations are overfulfilling plan assignments as a whole, but they have significant reserves for raising production efficiency.

For example, as the result of frequent breakdowns in the operation of industrial installations and pouring platforms the Orenburggazprom Association fell 43,000 tons short of the 1979 plan for liquefied gas. Large losses of gas condensate and a broad fraction of hydrocarbons are permitted in the production and transportation of the gas. The customer must also share the blame here too, of course. This is the Salavat Petrochemical Combine, which failed to receive more than 350,000 tons of condensate in 1979. At the same time, we cannot overlook cases where the plan for condensate delivery is not fulfilled because of the low quality and high water content of the product. But the Orenburg Gas Refinery often permits protracted shutdowns of industrial installations to remove mercaptans from the gas. This leads to serious complaints and substantial penalties from customers.

At the Turkmengazprom Association gas is not prepared satisfactorily for long-distance transportation. Only 22 percent of the gas recovered meets sectorial standards for hydrocarbons with respect to dew point and just 48 percent meets requirements for moisture. The reasons lie in both violations of industrial conditions at existing oil and gas extraction administrations and the serious lag in work to build refrigeration units at the Naip and Gurgutli fields. Much of the blame here goes to VNIPIgazdobycha (possibly All-Union Scientific Research and Planning Institute of Gas Recovery) and the Soyuzturbogaz (USSR Gas Turbine) and Soyuzgazavtomatika (USSR Gas Automation) associations, which have not provided solutions to technical problems or manufactured and delivered expansion turbines on time. The poor corrosion protection of gas networks at field facilities of the Shatlykgazdobycha (Shatlyk Gas Recovery) Association causes serious alarm.

The Komigazprom Association is one of the principal users of methanol, a valuable reagent. Each year the association has great difficulty getting about 30,000 tons of methanol delivered. At the same time a methanol regeneration unit has been under construction at the Vuktyl field for five years. If it were done the demand for this chemical would be cut by one-third and expenditures for gas recovery could be reduced by 1 million rubles a year.

Problems with the development of drilling require special consideration. This crucial area of our work no longer meets heightened requirements. The gas industry today has entered a more complex phase of development characterized by natural depletion of gas reserves in the European part of the country and a shift in the raw material base to remote, inaccessible regions of Siberia and to regions of Central Asia with complex geological conditions: anomalously high pressures and great depths. The drilling organizations proved not fully ready to work under these conditions. As a result, in the first four years they fell 680,000 meters short of plan assignments, planned rates of commercial drilling were not reached, and the construction of 155 planned producing wells was not finished. In terms of drilling volume the 1979 plan was short by 105,000 meters, and commercial rates were met in operations drilling by 94 percent. Failure to fulfill the drilling plan has become chronic at the Tyumengazprom [Tyumen' Gas Industry], Turkmengazprom, Konigazprom, and Soyuzuzbekgazprom associations. Already today there is a substantial shortage of producing wells at the Urengoy field, in the fields of West Uzbekistan, and in other regions.

The situation is worsened by substantial organizational downtime and time spent cleaning up after accidents. Two open gas gushers were permitted at one of the fields of the Soyuzuzbekgazprom Association this year and the Turkmengazprom Association lost 36 percent of its calendar time as the result of drilling accidents and downtime. This is one of the principal causes of failure to fulfill the exploratory drilling plan.

The Tyumengazprom Association did not prepare for large-scale operations drilling at the Urengoy field: side roads and industrial depots were not built; fill was not dumped to make platforms for drilling cluster wells; drilling equipment was not moved over from the Vyngapur and Medvezh'ya fields in time; and the problems of building housing, nursery schools, and other sociocultural facilities were not solved. All questions of well construction for such a basic field must be solved completely. Moreover, all the work must be organized so that well drilling is accelerated.

Gas transportation by trunk pipelines remains a subject of special concern. Despite generally hard work by the collectives of gas transportation associations, the operation of this key element of the National Unified Gas Supply System cannot satisfy us. Above all the pipelines and compressor plants do not operate efficiently enough, owing to slow development of work on the repair and protection of existing gas lines against corrosion, lack of proper technical supervision of the construction of gas transportation facilities, and in numerous cases the low level of technical concepts included in plans, poor technological and production discipline at certain compressor plants and pipelines, and the delay of associated sectors in building highly efficient new equipment.

A great deal of work is being done on the introduction of progressive new equipment to increase the reliability and efficiency of functioning of the National Unified Gas Supply System in conformity with the program that has been developed. Final touches and preparations have been completed for series production of the GTN-6 modular, no-basement gas pumping aggregates; industrial production of 10,000-kilowatt aggregates with ship drive has begun. The latter aggregates have done very well in practice and are as good as the best world models in terms of technical parameters. A great deal of work has been done on continuing modernization of the GPA-Ts 6.3 aggregates; specifically, a supercharger with a working pressure of 75 kilogram-force per square centimeter has been built and compositional concepts have been improved.

In 1979 testing was begun on a new 25,000-kilowatt gas pumping aggregate and a 10,000-kilowatt two-stage supercharger was manufactured and delivered for testing. It is to be used as part of the gas pumping aggregates with gas turbine, ship, and electric drive.

The contribution made by our scientific research organizations to technical re-equipping of the sector, automation of gas industry facilities, and building territorial production complexes in Western Siberia, Orenburgskaya Oblast, the Turkmen SSR, and elsewhere is well-known.

The large and very necessary projects being carried on by VNIlgaz [All-Union Scientific Research Institute of Natural Gas], namely the comprehensive plan for development of the Urengoy field, development of installations to obtain engine fuels at this field, and recommendations on raising the reliability of exploitation of the Orenburg field, deserve attention. We should also take note of the installation built by UkrNIlgaz [Ukrainian Scientific Research Institute of Natural Gas] to obtain methanol in Western Siberia and the recommendations of VNIPIgaz to prevent the formation of paraffin and emulsions at the Shatlyk field, among others.

Not all sectorial institutes are working as well as they can, however. There are still many unresolved problems. Among the most important assignments flowing from the resolutions of the November 1979 Plenum of the CPSU Central Committee is development of energy-saving technology in the field of gas recovery, transportation, and use. Institutes are not working hard enough on this problem. Specifically, not enough is being done to increase the gas and condensate yield of layers in the late stage of exploitation, reduce gas losses during transportation, and utilize recycled energy resources. VNIlgaz, SredAzNIlgaz [Central Asian Scientific Research Institute of Natural Gas], and other institutes are still giving too little attention to questions of intensifying gas recovery. VNIlgaz has not worked out norms for replacement of equipment that has become outdated and inefficient.

The Soyuzprengaz [USSR Gas Industry] Association is working too slowly on construction of the plant in the city of Pastov to produce high-efficiency gas-consuming equipment. The use of efficient gas equipment will provide an annual gas savings of 8-9 billion cubic meters for the country as a whole.

SredAzNIlgaz has not developed technology for sinking wells at fields with anomalously high layer pressures.

Serious problems have been found in the activities of the Soyuzgazavtomatika [USSR Gas Automation] All-Union Science-Production Association. The managers of the association must take decisive steps to sharply raise the efficiency of the automated control systems they are developing and the level of automation at gas industry sites. The problem of repair service to automated systems at the fields, pumping plants, trunk pipelines, and compressor plants must be solved immediately.

We have serious complaints against the Soyuzturbogaz Association, which is not doing adequate work to build standardized air-cleaning devices, systems to prepare fuel and launching gas, oil cooling systems, and recycling energy systems for compressor plants.

In light of the challenges posed by the November 1979 Plenum of the CPSU Central Committee, the directors of scientific research and planning institutes, managers of science-production associations, scientists, and designers should strive to give gas production solid scientific and engineering support.

The decree of the CPSU Central Committee and USSR Council of Ministers sets out important steps toward improvement of planning and the entire economic mechanism. Restructuring the planning and management mechanism in the sector is a major political-economic task. The scientific research institutes, above all VNIIGazprom [All-Union Scientific Research Institute of Economics, Organization, and Production and Technical-Economic Information in the Gas Industry], planning organizations, associations and enterprises, and the entire ministry apparatus must get to work on the necessary projects and strive to implement party and government decisions.

Rational use of fuel-energy resources and observing strictest economy measures is one of the national challenges that is made paramount by the whole course of national economic development.

The Board of Directors of the Ministry of the Gas Industry has considered the question of raising the efficiency of use of fuel-energy resources numerous times. Nonetheless, a thrifty attitude toward these resources is still not the norm everywhere. While demanding that associated sectors take effective steps toward rational and

economical use of gas, the first thing we must do is put things in exemplary order at our own enterprises, firmly halt all cases of gas waste, and comply strictly with established norms. Significant gas waste occurs at the Saratovtransgaz [Saratov Gas Transportation], Tyumengazprom, Komigazprom, and Uzbektransgaz [Uzbek Gas Transportation] associations. Large gas losses occur during cleaning of the pipeline. The Orenburg and Mubarek gas refineries permit above-ceiling gas usage.

Not all enterprises are working hard enough to save electrical energy. The Aztransgaz [Asian Gas Transportation] Association permitted direct losses of 10.6 million kilowatt-hours of electricity because of incomplete equipment loading, unplanned downtime, and violations of the working schedule.

Enterprises of the sector are not developing the recycling of thermal resources adequately. Utilization of these resources would permit saving about 4 billion cubic meters of gas a year. At the present time just 17 percent of this energy source is used. The Komigazprom, Sredaztransgaz, Saratovtransgaz, and Uraltransgaz [Ural Gas Transportation] associations have done particularly poorly with recycling energy resources.

In 1980 the sector has been given the task of significantly increasing the use of recycled thermal resources. The managers of gas transportation associations should approach this crucial problem with great responsibility and proprietary interest and make maximum use of recycled energy resources in the production of vegetables, meat, and milk as well as for heating residential communities at compressor plants.

The inspectorates of the USSR State Gas Supervisory Office play a large part in economical expenditure of gas. They must work constantly to improve the use of gas in all economic sectors, including monitoring the introduction of highly efficient new gas-consuming equipment, its timely adjustment, intelligent operation, use of the heat from products of combustion, and precise recording of gas use and heat energy produced. Cases of wasteful gas use and violations of gas consumption discipline must be stopped completely and brought to the attention of the broad public community.

In his talk at the November 1979 Plenum of the CPSU Central Committee Comrade L. I. Brezhnev devoted considerable attention to capital construction, a major nationwide problem. The party is constantly looking after further development of the fuel-energy complex, above all the gas industry, and each year appropriates enormous capital investment and material resources for this purpose. We are doing a great deal of construction. Nonetheless, this decisive sector of our activity continues to be the most vulnerable spot. Failure to fulfill

the plan for launching productive capital, housing, and socio-cultural-domestic facilities and exceeding norms for incomplete construction have become chronic problems in recent years. A large share of the responsibility for the strained situation that has come about in capital construction falls to the managers of associations, directors of planning institutes, and chief engineers on projects. It is absolutely intolerable that the plan for such a major construction project as the Urengoy - Vyngapur - Chelyabinsk gas pipeline was published without the necessary organizational chart of transportation work and equipment storage. As a result, work to deliver equipment to the construction site was carried out in an extremely irregular manner.

There are cases of mismanagement of equipment storage on the Perm' - Kazan' - Gor'kiy and Chelyabinsk - Petrovsk pipelines and at installations of Ukrgazprom.

The construction of facilities is dragging out intolerably at many associations. At the Komigazprom Association, for example, the condensate stabilization plant in Sosnogorsk has been under construction since 1968. Enormous capital has been developed over a long period of time with no results for exploration of the lower horizons at the Vuktyl field. It is not accidental that incomplete construction there has reached 244 million rubles.

The heads of associations, directors of planning institutes, and managers of the Administration of Capital Construction and the Economic Planning Administration must take urgent steps and decisively raise the efficiency of use of capital investment.

The ministry has done a great deal in recent years to develop its own construction organizations. The volume of work done through our own forces in 1980 will be 4.5 times that of 1972, reaching almost 600 million rubles. The ministry is building more than 100,000 square meters of housing, nursery schools, hospitals, and trade and public catering facilities with its own personnel. Experience has shown convincingly that the decision to develop our own construction base was a correct one, and we will continue and refine this work.

Successful accomplishment of the great tasks facing workers of the sector in 1980 is possible only through broad development of socialist competition in all production collectives.

In response to the resolutions of the November 1979 Plenum of the CPSU Central Committee, the gas workers of Orenburg called on the collectives of all associations, enterprises, and organizations of the sector to develop socialist competition to fulfill the plan assignments of the 10th Five-Year Plan for all indexes ahead of schedule. The collective of the Orenburggazprom Association set as its goals: extracting and refining 2.3 billion cubic meters of gas beyond its five-year plan

assignments, reducing gas use for its own needs by 10 million cubic meters, and raising labor productivity 10 percent more than called for in the five-year plan assignment for this year.

The initiative of the collective at GKS-3 of the Komsomol LPUMG [Trunk Gas Pipeline Line Administration] of the Tyumentranagaz Association to save gas used for its own needs deserves approval.

Socialist competition to celebrate the 110th anniversary of the birth of V. I. Lenin has developed broadly in the sector. About 10,000 workers have obligated themselves to fulfill their personal and brigade five-year plans by this date. About 700 workers fulfilled their obligations ahead of schedule and are working against the account of the 11th Five-Year Plan today. Among them are the collectives of V. V. Khurta's drilling brigade from Ukrburgaz, I. S. Guseynov's drilling brigade from Kaspburneftegazprom, OPS-3 [Production Operations Service No 3] of the Poltava Gasfield Administration, G. Yu. Guseynov's well overhaul brigade of Artemeftegaz Oil and Gas Extraction Administration, G. S. Sachenko's well overhaul brigade from Kuban'morneftegazprom [Kuban' Offshore Oil and Gas Industry], S. P. Goncharov's installation brigade from Sibgazifikatsii [Siberian Gasification], tank fillers L. L. Vysotin of Soyuzuzbekgazprom and N. Ye. Korshunov of Tyumengazprom, and electric welder N. Mamadzhanov of Soyuzgasmashremont [USSR Gas Machine Repair].

These practical initiatives, truly arising from the heart of the masses and directed to raising production efficiency and work quality and accomplishing plan assignments ahead of schedule, must be given every support and broadly disseminated.

Party, trade union, and Komsomol organizations and the directors of enterprises and organizations in the sector must direct their organizational, mass political, and ideological work to the broad development of socialist competition among labor collectives. We must create a favorable working atmosphere in all elements of our economy, so that each collective works smoothly and precisely and attains high labor indexes.

Guided by the resolutions of the November 1979 Plenum of the CPSU Central Committee, the ministry worked out a set of measures to insure fulfillment of the assignments of the state plan and socialist obligations for 1980.

The final results of the work depend in large part on our persistence in solving the problems we face, our high demands, discipline, and organization in all production elements, and our ability to apply not just professional skills but also some "heart" to the cause.

We must take all necessary steps to insure uninterrupted gas supply to the national economy and for municipal-domestic customers. Work must be organized so that each completed kilometer of gas pipeline, each well, and each gas pumping aggregate is launched without delay. The underground gas storage reservoirs must work precisely, and the sector must mobilize its internal reserves and all production potential. It is essential for all elements of the National Unified Gas Supply System to function smoothly and reliably.

There is no question that Soviet gas workers, showing great patriotic consciousness, will multiply their creative and labor efforts and raise up the banner of socialist competition to celebrate the 110th anniversary of the birth of V. I. Lenin in a worthy manner and not just fulfill but also overfulfill the assignments of the concluding year of the five-year plan.

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FUELS

TYUMEN' GAS ASSOCIATION CHIEF SURVEYS 1980 TASKS

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 p 10

[Article by G. P. Sulimenkov, head of the Tyumen' Gas Industry All-Union Production Association: "More Attention for the Concerns of Northern Gas Workers"]

[Text] A number of complex scientific-technical problems related to the organization of gas drilling, recovery, and transportation in Polar regions and permafrost regions were solved for the first time in world and domestic practice in the northern part of Tyumenskaya Oblast. The problems of concentrating recovery and transportation capacities are being resolved successfully. In the first four years of the current five-year plan, the total provisional economic impact from introduction of new technology and efficiency proposals is more than 60 million rubles.

More than 300 billion cubic meters of gas has been extracted in the first four years of the current five-year plan. The Medvezh'ye and Vyngapur fields have been brought to projected capacity. Three comprehensive gas preparation installations have been built and launched at the Urengoy field.

Considerable work has been done on gas transportation. The quadruple-line pipeline system from Urengoy through Medvezh'ye, Punga, and the Urals to the Central Zone has been brought up to projected capacity. The double-line system going from Urengoy through Vyngapur and Tyumen' to Chelyabinsk has been built and launched and the takeoff line to the Tyumenskaya Central Heat and Power Plant has been built and put into operation.

Capital construction plays a determining part in development of the oblast gas industry. In the first four years of the current five-year plan the association has incorporated 4.5 billion rubles of capital investment, twice as much as during the entire Ninth Five-Year Plan. At the same time, construction organizations fail to

fulfill established plans for launching capacities year after year. Moreover, the facilities that are turned over have significant omissions and the quality of work could be much better, especially for nonproduction facilities. Capital investment planning practices for nonproduction construction cause serious alarm.

In 1980 the Tyumengazprom [Tyumen' Gas Industry] Association is to increase extraction about 40 billion cubic meters, to a total of 150 billion cubic meters of gas. In the fourth quarter of 1980 gas recovery volume should be 455 million cubic meters a day. The entire increase in extraction will come from the Urengoy field. To do this it is necessary to increase the volume of drilling work at the field 2.5 times and build comprehensive gas preparation installation No 5.6. In addition, more than 1,100 kilometers of pipeline in the Urengoy — Chelyabinsk and Urengoy — Ukhta — Gryazovets systems must be launched.

The tasks facing the association in 1980 are major ones and they can only be accomplished with a comprehensive approach, developing the entire infrastructure and, above all, the systems of energy supply, transportation, housing, and sociocultural-domestic facilities.

Roughly 900 kilometers of 110-220 kilovolt power transmission lines must be put into operation to supply electricity for the growing volume of gas recovery and transportation in 1980; this is more than was built in the first four years of the 10th Five-Year Plan.

Launching of the 500-kilowatt overhead line from Kholmogory through Tarko and Sale to Urengoy in 1980 is especially important for the Urengoy complex, but the USSR Ministry of Power and Electrification is not planning to launch this line and, accordingly, is not providing materials to the Nadymelektroset'sstroy [Nadym Electric Grid Construction] Trust. Power plants with capacities of 150,000-170,000 more kilowatts must be brought online to provide electricity to gas recovery and transportation installations in 1980.

The gas industry of Tyumenskaya Oblast is inconceivable without aviation. Shipping by air has become an accepted part of the process of exploiting gas fields, pipelines, and especially supplying equipment to construction projects. Unfortunately, our aviation needs are not being fully satisfied.

A difficult situation has developed with providing housing for gas industry workers. The plan for introduction of housing in the first four years of the five-year plan has been only 74 percent fulfilled. For this reason urgent steps must be taken to increase the capacities of construction subdivisions, in particular Sibzhilstroy [Siberian Housing Construction].

The association is using its own personnel to build supply depots, trade, public catering, sociocultural-domestic, housing, and municipal service facilities and to line the mouths of gas wells and, in part, to lay pipe.

The Tyumengazprom All-Union Production Association could do a great deal more construction and installation work with its own personnel if adequate capital and materials were allocated.

The tasks facing the association in 1980 are very important ones. The workers of the gas industry of Tyumenskaya Oblast will apply all their effort, experience, and knowledge to accomplish them successfully.

Our collective has adopted stepped-up socialist obligations in honor of the 110th anniversary of the birth of V. I. Lenin.

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FUELS

HEAD OF KOMI ASSR GAS ASSOCIATION REVIEWS PROBLEMS, 1980 TASKS

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 pp 13-14

[Article by O. N. Solov'yev, head of the Komi ASSR Gas Industry All-Union Production Association: "Effective Steps are Being Taken"]

[Text] The collectives of the enterprises of the Komigazprom [Komi ASSR Gas Industry] All-Union Production Association achieved some successes in the fourth year of the 10th Five-Year Plan. The assignment for extraction and transportation of gas was overfulfilled, and hundreds of tons of hydrocarbons, thousands of tons of broad fractions and propane, and millions of cubic meters of stabilization gas beyond the plan were produced. The total of above-plan production for the first four years of the five-year plan is more than 3 billion cubic meters of gas and about 400,000 tons of nonstable condensate.

The Vuktyl Gasfield Administration, the Ukhtatransgaz [Ukhta Gas Transportation] Production Association, and the deep drilling expedition won several prizes based on the results of All-Union socialist competition among collectives of the sector.

The association has concentrated prospecting and exploration for petroleum and gas at two development sites in the Upper Pechora basin of the Subural foredeep, the Vuktyl and Patrakovskiy sites.

At Vuktyl prospects for increasing reserves are linked to deep horizons of the structure above the thrust formation where the first prospect wells found shows of oil and gas.

Four wells (Nos 40, 41, 42, and 52) at depths of 5,508-6,400 meters have been drilled to deep horizons at the Vuktyl site and are in the testing phase. Drilling is continuing on three other wells (Nos 50, 51, and 55).

An objective assessment of the industrial significance of the oil and gas in the deep horizons is being held up by technical difficulties in

sinking and incorporating wells. These difficulties are a result of complex mining geological conditions.

Concurrently with investigation of pools in deep horizons we are exploring the periclinal sectors of gas condensate pools being worked, and have obtained industrial flows of oil from them.

A gas pool with anomalously high layer pressure has been identified in terrigenous-carbonate Lower Carboniferous beds at a depth of 3,307-3,501 meters in prospect well No 1 at the Patrakovskiy site.

The job of geologists and drilling workers of Komigazprom in 1980 at the Vuktyl (deep horizons) and Patrakovskiy sites is to complete prospecting for the purpose of evaluating gas and oil prospects and prepare for industrial development of the new pools of gas, condensate, and petroleum in the 11th Five-Year Plan. In addition, drilling workers are expected to drill 30,000 meters of production wells and 20,000 meters of exploration wells.

The new types of bits of the series AN, AV, EShP, and VDP are to be used extensively in the 1980 program of drilling, to sink 15,000 meters of wells. The volume of rotary drilling with rolling cutter bits and turbine drilling using diamond and ISM [synthetic] bits will increase significantly. The volume of turbine drilling using high-torque turbodrills is to be increased to 12,000 meters.

A set of measures has been worked out to open up productive horizons better and prevent complications in setting up wells. The introduction of new equipment and technology and insuring good production organization in well drilling will permit a significant improvement in the technical-economic indexes of the drilling enterprises.

Concerning the recovery and preparation of gas and condensate for transportation, plans envision further improvements in technological processes of influencing the layer (face zone), modernization of separation equipment, launching more than 20 new wells and comprehensive gas preparation unit No 8 with a productivity of 14 million cubic meters a day, introducing a booster compressor plant and methanol regeneration unit at the Vuktyl site and expansion turbines at comprehensive gas preparation installation No 5, and performing at least 30 well operations to intensify recovery and capital repair on at least 20 gas wells.

With respect to processing the gas and condensate, plans envision establishing conditions for extracting helium from by-product petroleum gases, completing construction on the NTK [expansion unknown] compressor plant complex, beginning operations using a triple-column scheme for refining unstable condensate, introducing a unit to capture technical carbon in the projected regime, and continuation of work to increase output produced with the Mark of Quality.

In the field of gas transportation we must insure planned introduction of the gas pipeline segment from Urengoy through Punga and Ukhta to Gryazovets, which includes crossings of large rivers, and improve the operating reliability of compressor plants and the line itself, giving special attention to improving electrical and chemical protection.

The association faces major challenges in the area of technical re-equipping. Technical problems are arising with respect to gas preparation as the result of the delay in construction at the Vuktyl field and the drop in layer and wellhead pressures. To increase the working efficiency of the separation equipment and improve the condition of the gas we are replacing the louver-type nozzles with grated baffle plates of TsKBN [expansion unknown] design and centrifugal separation elements made by UkrNIIGaz [Ukrainian Scientific Research Institute of Natural Gas]. Replacing existing heat exchange equipment is equally important. In 1979 a BTDA-5/100 expansion turbine unit was launched at Vuktyl. Expansion turbines are to be built for comprehensive gas preparation unit No 5 in 1980.

Konigazprom has devoted significant attention in recent years to questions of improving management. Broad use of electronic computer equipment and setting up automated systems to control enterprises and industrial processes in the recovery, refining, and transportation of gas and condensate have been one of the areas of work. At the present time we have sufficient computer capacity.

The association formed a group information-computing center in 1978 to concentrate computer capacities, centralize development work, and improve the efficiency of computer use. The center provides centralized service to enterprises and organizations with its computer equipment. This has made it possible to expand the number of enterprises using computers for management purposes, switch to standardization of development projects done by our own personnel, and reduce capital and operating expenditures for setting up automated control systems at enterprises of the association.

Future plans envision improving and developing existing automated control systems to reach the projected situation where we have functioning sets of hardware and problems and to establish precisely operating automated control systems for the industrial processes of preparing, transporting, and refining gas and condensate.

We have formed our own construction organization for capital repair of production facilities and building certain projects within the association. These organizations currently do 24 million rubles of construction and installation work a year. The main thing that prevents our construction workers from developing normal operations is the lack of production bases.

Our labor successes are based on the heroic labor of the workers, foremen, and engineering-technical personnel, who are devoting a great deal of effort, labor, and energy to fulfilling the plan assignments of the 10th Five-Year Plan.

Enterprises of the association now employ more than 3,300 specialists, and 1,000 of them have higher education. During the 10th Five-Year Plan about 1,000 managers and engineering-technical personnel have improved their qualifications at higher educational institutions, *tekhnikums*, and special schools. The association operates two training combines, 31 technical training offices, 15 shops, sections, and workshops for production experience to improve worker qualifications. The workers are trained by 169 teachers and 132 production instructors. In 1979 a 720-student technical school began training compressor operators, specialists in control and measuring equipment and automation, equipment repairmen, and electricians for our enterprises.

The 1980 plan envisions retraining for 800 workers and raising qualifications for about 200 managers and engineering-technical personnel and roughly 1,500 workers.

The collectives of all the enterprises of the association are participating in socialist competition to fulfill the assignments of the 10th Five-Year Plan ahead of schedule. More than 10,000 workers and foremen have joined the patriotic movement under the slogan from Rostov: "Work without anyone falling behind!" Among the best collectives are those at production operations service No 2 of the Vuktyl Gasfield Administration, the Sosnogorsk LPU [possibly Line Production Administration], and the Mikun' LPU, which had excellent achievements in the fourth year of the five-year plan.

The gas workers of the association are approaching the 110th anniversary of the birth of V. I. Lenin in a state of great political and labor and enthusiasm. The drilling brigade headed by honored foreman of the Ministry of the Gas Industry A. N. Andrianov was one of the first brigades to uphold the initiative of the Moscow workers to fulfill the plan of the 10th Five-Year Plan by this portentous date. In May 1979 Andrianov's brigade reported completion of the plan, and in June it finished its socialist obligations for the first four years of the five-year plan.

The collective of Komigazprom has undertaken new socialist obligations for 1980. We have decided to recover 50 million cubic meters of gas and 10,000 tons of unstable condensate beyond the plan and produce 5,000 tons of stable condensate, 3,000 tons of liquefied gas, and 250 tons of technical carbon beyond the production program.

The working people of the enterprises of the Komigazprom All-Union Production Association enthusiastically approve of the policy of our party

and government. They understand very well that socialist competition in honor of the 110th anniversary of the birth of V. I. Lenin will promote further development of labor and public activism in the people and mobilization of efforts to fulfill the 1980 plan and establish a good foundation for a successful start to the 11th Five-Year Plan. The gas workers of the Komi ASSR will do everything they can to make a worthy contribution to the cause of building the Timan-Pechora territorial production complex.

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SUCCESSFUL CENTRAL ASIAN GAS TRANSPORTATION HEAD SURVEYS 1980 TASKS

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 p 15

[Article by V. N. Dedeshko, director of the Central Asian Gas Transportation Production Association: "Creative Searching Is the Foundation of Success"]

[Text] As they perform the tasks set down by the 25th CPSU Congress and subsequent Plenums of the Party Central Committee the collective of our association devotes a great deal of attention to improving the style of work and developing initiative and the innovative spirit.

Considerable credit for successful accomplishment of plans of technical development and organizational-technical activities goes to leading production workers and innovators, efficiency workers, and inventors. The collective of the association has achieved good results thanks to their heroic labor and creative searching. In 1979 our collective won first place three times and took the challenge Red Banner in All-Union socialist competition.

The basic task of our public organizations and the entire collective in 1980 is to reinforce our success and maintain the fervor of socialist competition. The association has outlined concrete steps toward unconditional fulfillment of plan assignments for gas transportation.

We must intensify work on repair and improving the reliability of the line. Work on periodic cleaning of the inside of the line to keep it in satisfactory hydraulic condition will be performed on segments with a total length of 2,308 kilometers.

Our arsenal of means of preventing corrosion on gas pipelines is undergoing fundamental reorganization. Technical innovations such as deep anode grounding based on carbon-graphite pipe will be employed. The obsolete cathode protection stations will be replaced by 140 UKZV-10 corrosion resistance units, which are more powerful and reliable in operation. A total of 378 cathode protection stations will be built

and rebuilt and the power transmission lines supplying the cathod protection stations will be repaired. All this work aims at insuring 100 percent protection for trunk gas pipelines.

We call the compressor plants the heart of our gas transportation system. Their working rhythm determines the success of gas delivery to the customers.

In 1980 the association must work even harder to insure the reliability of the basic and auxiliary equipment of compressor shops and to raise the level of its technical maintenance.

A great deal of work must be done on modernization of gas pumping units, specifically (1) replace water cooling with air cooling at 25 units (Khiva, Kungrad, and the Tuley compressor plant); (2) install and launch inertia filters at 28 GTK-10 gas turbine compressors, which will increase the working life of the vanes of axial-flow compressors; (3) replace worked-out GT-750-6 gas turbines with modernized Aurora machines; (4) carry out work to launch the experimental STDP-12500 electric drive aggregate at the Karakumy compressor plant and six GTK-10 gas turbine compressors at the compressor plant in Akchalok.

Work will continue in 1980 on drying and cleaning impulse gas and improving the quality of repair for control and measuring equipment and automated devices and the reliability of instruments that monitor the temperature of products of combustion and the vibration of gas pumping units. Automatic cleaning of dust traps and various other measures are planned to significantly reduce the expenditure of gas for our own needs.

The supply of electricity to compressor plants, especially those located on the Ustyurt plateau where the timetable for turning over the 110 kilowatt hour transmission line and 110/6 kilovolt substations has been delayed, intolerably, remains a critical problem this year. Given this situation, we are forced to use various supplementary sources of energy, which reduces the operating reliability of power supply units, switching circuits, and other equipment.

The various forms of socialist competition and dissemination of progressive labor methods will continue to develop in the association. Association efficiency workers and inventors plan to produce an economic impact of more than 150,000 rubles from introduction of their proposals.

We face a great deal of creative work, and there is no doubt that the working people of the association will successfully fulfill the assignments of the final year of the 10th Five-Year Plan, that in the year of the 110th anniversary of the birth of V. I. Lenin they will work Lenin-style, like shock workers.

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ORENBURG GAS ASSOCIATION HEAD SURVEYS CURRENT SITUATION, TASKS

Moscow GAZOVAYA PROMYSLENNOST' in Russian No 2, Feb 80 p 11

[Article by Yu. F. Vysheslavitsev, head of the Orenburg Gas Industry All-Union Production Association: "Development of the Gas Complex"]

[Text] For the thousands of members of the collective of the Orenburggazprom [Orenburg Gas Industry] All-Union Production Association 1980 is a year of continued development of their creative potential, which is directed to carrying out the resolutions of the 25th CPSU Congress with respect to continued growth of the Orenburg industrial-territorial natural gas extraction and refining complex.

Supporting the initiative of leading enterprises in the country, the association has developed broad competition to fulfill the five-year plan by the 110th anniversary of the birth of V. I. Lenin. The initiator of this movement was the brigade of plasterers headed by G. Ye. Davydova at the Orenburgremgazstroy [Orenburg Repair Gas Construction] Trust. The workers, engineering-technical personnel, and employees of the association, in their endeavor to celebrate the 110th anniversary of the birth of V. I. Lenin in a worthy manner, have assumed stepped-up socialist obligations for the fifth year of the 10th Five-Year Plan.

On the basis of measures to further raise the level of automation and full mechanization of labor-intensive processes, introduce new machinery, and improve the organization of labor and management, plans envision a 10 percent greater increase in labor productivity than assigned for 1980 in the five-year plan, extraction and refining of 2.3 billion cubic meters of gas beyond the five-year plan assignment, and increasing the volume of above-plan extraction and refining from the start of the five-year plan to 12 billion cubic meters by the 110th anniversary of V. I. Lenin.

We intend to reduce gas use for our own needs by 10 million cubic meters and to conserve 30 million kilowatt-hours of electricity and 200,000 gigacalories of thermal energy. An economic impact of 3.5 million rubles will be achieved from introduction of inventions and efficiency proposals.

The collective of our association has called on the collectives of other enterprises and organizations of the gas industry to develop broad socialist competition to fulfill the plan assignments of the 10th Five-Year Plan for all quality and quantity indexes ahead of schedule and to work under the slogan "High-Quality Output to Customers at the Agreed Time."

We are expected to incorporate more than 180 million rubles of capital investment in 1980 and to launch 153 million rubles of fixed capital in operation. The gas refinery will begin operating a number of new second and third phase facilities.

The condensate pipeline from the Orenburg Gas Refinery to the Salavat Petrochemical Complex and Novoufimskiy Oil Refinery will be built, and construction will continue on the ethane line from Orenburg to Kazan', the Sovkhoznnyy underground storage facility, the industrial equipment repair plant, and an installation to extract odorant.

In 1980 we must perform the jobs included in the comprehensive target program to supply sites with automation and remote control equipment and introduce automated control systems. There is a great deal of non-production construction to be done also. More than 24 million rubles of capital investment is to be incorporated.

Consistently implementing plans for socioeconomic development in the field of housing and cultural construction, enterprises of the association will build about 70,000 square meters of housing, two nursery schools, a hospital, dormitories, a training combine, a vocational-technical school, a Pioneer camp in the city of Anapa, and more.

To insure stable operation of the gas refinery at the projected level of 45 billion cubic meters of gas a year the association is conducting a great deal of exploration of gas condensate fields and seeking possibilities of connecting new fields to the plant. We are conducting explorations at the Krasnyy Yar and Vostochno-Kardailovskaya sites and the Ust'-Ilek uplift with our own personnel. Prospecting and exploration drilling should reach 10,000 meters this year.

The stepped-up obligations that have been assumed by our collective will demand full exertion by the workers, engineering-technical personnel, and employees of Orenburggazprom. All organizational and mass political work by party, trade union, and Komsomol organizations and economic managers today aims at this goal. Our Orenburg gas

workers are filled with a resolve to work Lenin-style and perform their plan assignments and socialist obligations ahead of schedule and make a worthy contribution to fulfillment of the historic decisions of the 25th CPSU Congress.

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SOLUTIONS TO PROBLEMS EYED BY TURKMEN GAS ASSOCIATION HEAD

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 2, Feb 80 p 12

[Article by V. A. Talday, head of the Turkmen Gas Industry All-Union Production Association: "With Maximum Plan Intensity"]

[Text] The Turkmen SSR and the Turkmengazprom [Turkmen Gas Industry] All-Union Production Association are second in the country for gas extraction.

In the first four years of the 10th Five-Year Plan the association extracted 50 percent more gas than in the Ninth Five-Year Plan.

We recovered more than 11.3 billion cubic meters of gas beyond the four-year assignment envisioned in the five-year plan and sold output worth more than 60 million rubles.

The association has set up an automated production control system based on five third-generation computers. At the present time 15 sets of problems covering all areas of association activity are decided in the administrative apparatus entirely by means of computers. The Shatlykgazdobycha [Shatlyk Gas Extraction] Production Association also operates an information-computing center.

Introduction of new equipment has provided an economic impact of about 30 million rubles.

In the first four years of the 10th Five-Year Plan more than 60,000 square meters of housing, a vocational-technical school, a general school, a nursery school, a hospital, winter and summer clubs, a music school, 152 kilometers of side roads, 750 kilometers of electric power transmission lines, stores, dining halls, a Pioneer camp, and auxiliary facilities have been built and put into use.

Two nursery schools, a preventive clinic, two Pioneer camps, and a public shopping center are under construction.

In 1980 plans call for the construction and introduction of more than 21,000 square meters of housing, a nursery school, a boarding school, two Pioneer camps, and more.

In 1980 the Turkmengazprom Association plans to extract 2.6 billion cubic meters more than envisioned by the plan of the Ninth [sic] Five-Year Plan. For objective reasons the gas extraction plan of the association in the final year of the 10th Five-Year Plan will be very intense.

The intensity of the plan is heightened by the fact that the Ministry of Construction of Petroleum and Gas Industry Enterprises is working slowly at our sites. Construction and installation of the sulfur decontamination unit at the Gugurtli field has dragged on into the period of industrial operations, and at the refrigerator stations in Naip and Gugurtli is going poorly, which particularly affects the quality of gas preparation.

The association is carrying on prospect-exploration and production drilling at 31 sites spread out all over Eastern Turkmenistan. The move into new, unsettled, geologically complex regions to a large number of sites far from supply depots, without roads, electricity, and water, makes drilling work even more difficult to conduct.

Unsatisfactory material-technical support for drilling also has a negative effect on plan fulfillment.

To accomplish the production program outlined for the Turkmengazprom Association in 1980 the following must be done: launch the new Beurdeshtik field and horizon XV with sulfur gas at the Gugurtli field; drill 113,000 meters of production wells and 155,000 meters of exploratory drilling; launch 42 new wells at the booster compressor plant (second phase) in Achak, and other facilities.

Considering the difficulty of delivering diesel fuel to exploration sites that are located in roadless barkhan deserts, the association with VNIIGaz [All-Union Scientific Research Institute of Natural Gas] and VNIPIgaz [All-Union Scientific Research and Planning Institute of Natural Gas] are working on the problem of switching part of the condensate recovered to our own needs. It would be desirable for VNIIGaz to manufacture one set of the small UPD-801 condensate refining unit for installation in Naip in the first quarter of 1980 and for VNIPIgazdobycha [All-Union Scientific Research and Planning Institute of Gas Extraction] to carry out the plan for adapting this device to the existing production scheme at the field.

Alongside work to increase the volume of gas recovery and drilling work in 1980, we will continue work on reconstruction of existing industrial layouts and introduction of new equipment and automated control

systems. In particular, plans envision experimental-industrial testing of BTDA-5/100 expansion turbines at the Shatlyk and Kirpichli fields.

The time has come for the association to establish a sectorial institute based on the Turkmen branch of VNIlgaz, because planning and scientific research projects for Turkmengazprom are done by a large number of institutes located in various parts of the country. This makes it impossible to solve problems on an operational basis, uphold a definite policy in particular matters, and follow a system in solving the problems facing us.

Despite the great intensity of our production plan, the working people of the Turkmengazprom All-Union Production Association will make every effort to fulfill all obligations and celebrate the 110th anniversary of the birth of V. I. Lenin in a worthy manner.

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FUELS

AUTOMATION OF AZERBAIJAN GAS SUPPLY ASSOCIATION

Baku VYSHKA in Russian 15 Mar 80 p 2

[Article by R. Verdiyan: "Automated Control System in Action"]

[Text] Powerful trunk gas pipelines stretch thousands of kilometers over the territory of our republic. Millions of cubic meters of blue fuel daily enter on them the industrial enterprises and residential areas not only of the Azerbaijan SSR, but also the entire Transcaucasus region.

Great responsibility for continuously supplying fuel to industrial facilities and population is borne by the production association "Astransgaz" that includes the collectives of the Kazakh, Agdash and Kazi-Magomed line-production administrations of the trunk gas pipelines, as well as the station for underground gas storage. The workers of these subdivisions of the association are doing a lot in order to guarantee the normal supply of fuel to all the sections they serve. Whereas the year before last, for example, about 20 violations of the pattern of gas transporting were recorded, last year there were only two.

In the sharp reduction in the number of violations, in addition to the improvement in the qualification of the service personnel an important role was played by the introduction of an automated control system for the processes of gas pumping. Its main link is the devices with pneumatic or electrical drive guaranteeing control over the work of the compressor facility, "ERA-1" and "Kompessor-3." They permit automatic start-up and uniform loading of the gas-pumping aggregates, and observation from the control room of all the parameters of their operation. Hermetically-sealed relay, automatic interlocking and duplication of the control circuits prevent not only the possibility of erroneous switchings of the gas equipment, but also permit its operation without the constant presence of the service personnel.

These and a number of other automatic and remote control systems introduced at the enterprises "Aztransgaz" during the years of the 10th Five-Year Plan made it possible to improve a great deal the quality of work of all the links in the facility, to facilitate the labor-intensive processes, and essentially reduce to nothing the probability of gas leakages. For example,

the system of remote control developed on the "temperature" principle by the specialists of the start-up and adjustment administration "Orgenergogaz" makes it possible to automatically stop the compressors with the slightest change in their operating characteristics.

However, with the modern volumes of transporting of blue fuel these resources are already insufficient for guaranteeing the reliable operation of the trunk gas pipelines. The need for rapid transfer of the most important information to the main computer center of the USSR Unified System of Gas Supply, working out of the optimal patterns for the technological processes from the results of the calculations made there placed on the agenda the task of equipping the gas supply facilities with more advanced instruments and mechanisms.

Currently the efforts of the specialists of the service of control and measuring instruments and automation equipment "Aztransgaz" as well as the Kazakh and Agdash line-production administrations have put into operation a new system of remote control called "Impuls-2." With its help the line dispatchers will be able to constantly have a complete idea about the pressure, temperature and expenditure of gas over the entire 1000-kilometer route, and control the shut-off fittings, and stations for cathode protection of the pipes from corrosion from a distance. The information received from the administration with the help of the special apparatus installed in the control room of the association will enter the main computer center of the USSR Unified System of Gas Supply round-the-clock; based on the findings the system will coordinate the work of the trunk gas pipelines of the entire country.

Evidently, the automated control system for the technological processes in the association "Aztransgaz" will bear a great effect. But there is also no doubt that it could be much higher if one of the main conditions for the smooth operation of the system was successfully guaranteed--the reliable operation of the communications channels between the association and its subdivisions. Intercity telephone stations of the Ministry of Communication of the republic often undermine the gas workers. Thus, last year more than once the workers of the gas pumping station in Mingechaur could not transmit operational informational data to Baku for several days. And this, as indicated above, led to disruption in the gas supply of the entire Transcaucasus region.

Of great importance is the constant perfection in the technical knowledge of all the engineering-technical workers of the enterprises in the association as well as the training of the appropriate personnel for the automated control system in courses and in institutes for improving qualification. All of this will permit a more complete use of the potentialities of the automated control system of the association, and attainment of its precise and effective functioning.

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FUELS

GAS LIFT IDEA RESURRECTED TO PRODUCE NEW OIL EXTRACTING EQUIPMENT

Baku VYSHKA in Russian 23 Mar 80 p 2

[Article by chief engineer of the all-union production association "Kaspiy-neftegazprom," Hero of Socialist Labor A. Dzhaferov: "Gas Lift in Work Outfit"]

[Text] The special design office for planning oil and gas extracting machines and equipment of the all-union production association "Soyuzneftemash" has entered the following work in the competition for the state prize: "Broad Industrial Introduction in the Oil and Gas Extracting Branches of Azerbaijan and the Union of Modern Designs of a Highly Efficient Complex of Well Gas Lift Equipment." Its authors, Sh. Dzhaferov, M. Gadashev, A. Dzhavadyan, V. Krol', V. Karpov and G. Eyvazov represent the collectives of the scientific design, planning, plant and oil and gas extracting organizations and institutions, having united efforts to solve one of the important problems of mechanization, automation of the labor of the oil workers, and saving of raw material and materials.

Back at the dawn of the development of the main oil base of our country, Azerbaijan, it was determined that in the presence of resources of compressed gas and gas compressor stations for the complicated operating conditions the most effective is extraction of oil by the gas lift or compressor method. This method makes it possible to successfully extract oil practically from any depths.

Nevertheless, despite the considerable advantages the set of such equipment had great metal consumption, the putting into operation and operation of the gas lift and compressor wells required the presence in the high pressure systems of gas or compressed air. The metal consumption grew with the depth since in the well, as a rule, two rows of pipes are lowered, and 28 kg of metal are expended for each running meter of depth. These and other shortcomings led to the development of a more economical pumping method of operation that gradually squeezed out the gas lift and compressor methods.

However, the great technical and economic advantages of the gas lift method of oil extraction and its national economic importance for the development

of offshore, swamp, high-yield and complicated oil and gas fields are indisputable. Therefore the group of Azerbaijan specialists, designers, planners and production engineers developed a new complex of gas lift equipment whose high efficiency is guaranteed by the optimization of the pattern of oil extraction, reduction in consumption of compressed gas, minimum metal consumption of the well equipment, and simplification of the process of putting into operation and operation of the well.

The creation of this equipment, mastery of its series production at the F. E. Dzerzhinskiy machine construction plant provided the favorable and objective prerequisites for accelerated development of the gas lift operation at oil and gas fields not only of Azerbaijan, but also Kazakhstan, Turkmenia, Sakhalin, West Siberia, and a number of other regions of the country.

The new gas lift complex is an explicit example of the creative solution of the tasks of technical progress of the oil machine construction in Azerbaijan, which was indicated in the greeting letter addressed to the collective of workers of the all-union production association "Soyuzneftemash" written by the General Secretary of the CPSU Central Committee, Chairman of the Presidium of the USSR Supreme Soviet Leonid Il'ich Brezhnev in relation to the early fulfillment of the five-year plan by the association collective.

With the mastery of the production of the new gas lift complex for the offshore oil workers of "Kaspijneftegazprom" broad potentialities were created for a radical improvement in the conditions for use of the gas lift method of oil extraction at the fields "Neftyanyye Kamni," Peschaniyy-more, Sangachaly-more and others, where only the gas lift method is used of all the methods for mechanized extraction of oil. For the main advantages of the gas lift complex are increase in the efficiency of the equipment, increase in oil recovery, reduction in time and simplification of the process of assimilating outlays for production of repair and restoration work, reduction in the service personnel, automatic start-up of the wells after emergency situations, decrease in the metal consumption and specific expenditures of gases, etc. In a word, everything that is especially necessary to facilitate labor and increase the efficiency of production under offshore conditions.

The equipping of the wells with the complex made by the experimental design office "Neftemash" increases the efficiency of the gas lift unit. The well becomes self-regulating. This means that in the case of any unforeseen or emergency stops with the help of the gas lift valves, without the interference of the service personnel or additional operations the well itself starts-up, i.e., goes into the assigned pattern automatically. This opens up a broad vista for complete automation of the entire gas lift cycle. Not to mention many other advantages of the innovation, we note that the complex excludes the need for arrangement of the second row of lift pipes that has already become traditional.

The complex is the only one of all the extant equipment for mechanized methods of oil extraction and it is used in considerable volumes for development of the deep fields.

The economic effect from the use of the gas lift equipment at the Azerbaijan fields is 5.2 million R. It is obtained due to the increase in the oil extraction by 50,000 T, reduction in consumption of compressed gas, saving of pump-compressor pipes, decrease in the duration of well development 8-10-fold, improvement in labor productivity, and reduction in the volume of work for underground repair of the wells 1.5-fold.

The significant work of the experimental design office Neftemash that was done to render technical assistance to the oil workers of Azerbaijan and the country played an important role in accelerating the development of the gas lift of new modification. It should be noted that a great cycle of experimental-field work was done at the stage of creating the equipment in the Serebrovskiy Oil and Gas Extracting Administration.

The high level of scientific and technical quest was marked by certificates of authorship. The complex of new equipment was exhibited many times at the all-union and foreign exhibitions and was awarded 17 medals of VDNKh [Exhibition of Achievements of the USSR National Economy] of all merits. The main assemblies of the equipment are being manufactured with the state sign of quality.

One can conclude with confidence that without the created gas lift equipment it would be currently impossible to effectively develop such unique offshore fields as "Neftyanyye Kazni," Peschanyy more, Sangachaly-more and others.

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IMPROVING GEOLOGICAL RESEARCH IN AZERBAIJAN

Baku VYSHKA in Russian 26 Mar 80 p 2

[Article by chief geologist of the all-union industrial association "Kaspmorneftegazprom," Candidate of Geological and Mineralogical Sciences Kh. Yusufozade: "Know the Depths of the Earth Better: Work with Perspective"]

[Text] In the second half of last year VYSHKA held a discussion on the questions linked to increase in the efficiency of geological research in exploratory drilling. The discussion was started by an article by Doctor of Geological and Mineralogical Sciences N. Khalilov published in the newspaper on 10 July under the title "Know the Depths of the Earth Better." Workers of the drilling enterprises, scientific research and planning organizations of Azerbaijan and other republics of the country participated in the discussion of the problem.

The letters of the participants in the discussion revealed the causes of the still insufficiently high level of geological and geophysical research of beds and wells, made suggestions directed towards elimination of the shortcomings present in this matter. It was stressed that an improvement in the efficiency of the entire complex of geological studies of the depths of the earth is the most important condition for successful exploration and putting into operation of new oil and gas fields.

By publishing the articles of the chief geologists of the all-union industrial association "Kaspmorneftegazprom" Kh. Yusufozade and of the production association "Azneft" A. Guseynov the editorial staff summarizes the discussion results.

The discussion on the pages of VYSHKA of the problem of exploratory drilling yielded rich material for thoughts on the paths to increase the efficiency of geological and geophysical research in the process of tunneling wells. It

is important to stress that the majority of participants in the discussion made specific recommendations directed towards improving the efficiency of research. This gave the discussion of the problem a business-like, specific nature.

A broad circle of questions was raised in the articles of the head of the laboratory of VNIPIgaz [All-Union Scientific Research and Planning Institute of the Gas Industry], Professor A. Durmish'yan, senior scientist of UkrNII-gaz [Ukrainian Scientific Research Institute of the Gas Industry], Candidate of Geological and Mineralogical Sciences V. Zil'berman, head of the drilling MURB [Administration of Exploratory Offshore Drilling] "Bulla" E. Akopov, chief geologist of the N. Narimanov NGDU [Oil and Gas Extracting Administration] R. Dadashev, prorector of the M. Azizbekov Institute of Oil and Chemistry A. Kerimov and many others. It was correctly stressed that the success of exploratory work for oil and gas first of all depends on how scientifically substantiated is the selected technique of exploration that meets the peculiarities of the given specific field. Precisely such an approach to the matter makes it possible to guarantee the fulfillment of complicated exploratory tasks with the minimum volume of drilling work.

In this respect it is indisputable that attention should be drawn to the statement of the question as to the need for drilling on exploratory areas of several development wells in order to obtain from them extensive geological information and to limit the samplings of rocks to the extremely necessary intervals of the deposit section in the next wells.

In practice the role of such wells in our initial stage of exploratory work was placed on the first drilled wells. But it is impossible to be limited to information obtained only from them, since everyone knows how complicated the tectonic structure is of many fields in Azerbaijan, especially on the water area of the Caspian Sea. Here at times the number of tectonic blocks isolated from each other reaches several dozens. As a result, the new blocks found in the drilling process essentially become the object of exploratory works, from each of which it is necessary to obtain extensive geological information in order to prepare them for development.

Reduction in the volume of geological studies is possible only in those cases where drilling is done in fields that are not complicated in geological structure. Therefore, in the plans for construction of the wells that follow after the first we stipulate taking a core sample in intervals where the section has not yet been illuminated sufficiently well.

Unfortunately, as the participants of the discussion correctly noted, soil samplings even in these limited volumes are often not taken from the wells, which does great damage to the effective searches for oil and gas.

What conceals the main reasons for the formed situation that the participants of the discussion spoke of with understandable concern? They themselves give the answer to this question--first of all the shortcomings of planning the drilling work where the main indicator characterizing the

successful activity of the drilling exploratory enterprise is not the fulfillment of the geological tasks facing them, but the fulfillment of the plan for tunneling. Therefore it is no accident at all that the leaders of the drilling enterprises, trying to produce the assigned tunneling footage restrict, and at times abandon altogether research work in the wells. In other words, the exploratory wells often are converted into operating, which is quite impermissible.

All of this requires a radical improvement in the planning of the drilling work and its bringing into correspondence with the modern requirements. The decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving the Planning and Intensification of the Effect of the Economic Mechanism on Improving the Efficiency of Production and the Quality of Work aims the oil workers at this. It appears, in our opinion, that it has become necessary to create such an organizational structure of the drilling enterprises and a system of planning that in addition to the fulfillment of the plan for tunneling and completion of the wells would promote in every possible way the attainment of high results in conducting the entire set of geological studies of the fields.

The improvement in the efficiency of geological studies must be promoted also by intensification in the control over the course of well drilling, full implementation of the measures provided for by the geological and technical orders. Such control must be conducted by the geological services not casually, but every day, round-the-clock. This is especially important in the exploration of offshore oil and gas fields, when individual drilling wells are scattered over the entire water area of the sea and communication with them is often disrupted due to bad weather. All of this requires constant presence at the borehole of the representative of the geological service who could actively affect both the course of the well tunneling, rapidly react to certain changes in the drilling pattern, and the fulfillment of the stipulated research.

In attributing great importance to this question we have introduced the positions of geologists at all the floating drilling units among the brigade staff. In addition, such a position has been introduced into the staff of such an important object of exploratory work from stationary platforms as the 28 Aprelya field. At other areas where work is mainly underway at the stage of mapping the oil and gas deposits, control is implemented by the senior geologists for the group of wells assigned to them.

Of course, on the path of making geological control stricter for the course of tunneling the exploratory wells and conducting the necessary set of studies only the first steps have been taken. A lot still remains to be done for this control to be more active and efficient. To increase the quality of the research, in particular, of rock samples it would be expedient on the most important exploratory boreholes to have collectors on the brigade staff who are subordinate to the geological services.

Many participants in the discussion, speaking of the increase in efficiency of research, focused attention on the better equipping of the drilling enterprises and the appropriate organizations with the equipment necessary for this purpose.

As for the equipment for taking samples of rocks from the wells, then here, perhaps, one cannot help but agree with the head of the Baku section of the VNIBT [All-Union Order of the Red Banner of Labor Scientific Research Institute of Drilling Equipment] A. Mdivani and the senior scientist of this institute S. Nikitin, who assert that we have such equipment. At the same time, as shown by the experience of drilling exploratory well No 42 on the area of the Bulla Sea by the brigade of E. Akopov, the core sample can be taken from depths reaching 6,000 meters. And if this is not done, then first of all the guilty parties here are the leaders of the drilling enterprises who often with the connivance of the geological services do not strive to acquire the necessary equipment, be concerned about the training of people for work with the core-sample-taking apparatus, etc. Here again the shortcomings in the planning of the drilling work that we spoke of above let themselves be known.

But if the matter of the core-sample-taking equipment is resolved more or less favorably, then another picture is formed with the geophysical apparatus. The instruments that are currently at the disposal of the mineral explorers are still rated for conducting research on wells up to 4,000 meters deep. The geophysical field work is often disrupted also due to the absence of logging stations and hoists of a marine design. Great difficulties arise in the testing of the deep wells finished by drilling--there are no pneumatic drills rated for high pressures and small diameters of the tunneling openings of the casings. All of these and other questions were raised in their time and are being raised now before the appropriate organizations and departments, but they are being solved extremely slowly.

I would like to say several words about the article of the member of the coordination council on the problem of AHFP [anomalous high formation pressure] of the USSR Ministry of Geology K. Anikiyev published in VYSHKA on 10 October under the title "Illuminate with Theory the Path to the Oil Storeroom." The author raises extremely important questions of improving the efficiency of the exploratory drilling under conditions of high formation pressures. The advice contained in the article will be considered by us in our practical work. However, in our opinion, it is impossible to agree with K. Anikiyev that the laws governing the formation of anomalous high formation pressure (AHFP) are controlled by the effect of deep factors, comprising, as is known, the basis for the inorganic hypothesis of the origin of oil and gas.

A further elevation in extraction of natural fuel in the fields of the Caspian depends a lot on the most rapid development of the deeper and thicker oil, gas and condensate deposits that are characterized by greater pressures and temperature. It will not be easy to take the product from such deposits.

The path to success lies through a deep study of the behavior of the earth's depths, and processes occurring in them. Therefore it seems that a discussion of the problems of increasing the efficiency of geological research in drilling conducted on the pages of VYSHKA indisputably will play a positive role in this matter.

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PROBLEMS IN EXPLORATORY DRILLING DISCUSSED

Baku VYSHKA in Russian 26 Mar 80 p 2

[Article by chief geologist, deputy general director of the association "Azneft" A. Guseynov: "The Final Result is Most Important"]

[Text] The discussion held on the pages of VYSHKA on the problem of improving the efficiency of geological research on the earth's depths has great importance. For us, the geologists leading the exploration of the oil and gas fields on dry land, this problem acquires especial acuteness due to the discovery in the western and central regions of the republic of new oil and gas deposits in little-studied rocks. At the same time due to the available shortcomings in the organization of drilling exploratory work the volumes and quality of the incoming geological and geophysical information is still clearly insufficient in order to set up efficient development of the new fields.

One cannot help but agree with the opinion of many of the participants in the discussion that certain leaders of the oil and gas extracting administrations and drilling enterprises, striving at any price to guarantee fulfillment of the plan arbitrarily curtail conducting of the planned measures for study of wells. Here, as was correctly noted, the shortcomings show up in planning when not the qualitative but the quantitative indices are advanced to the forefront.

The need for regulating the questions of planning in drilling has been stated for a long time. Unfortunately, we are doing little essentially in this respect, and we forget that an increase in the efficiency of geological exploration work depends first of all on the fulfillment of an entire complex of studies stipulated by the projects for well construction. As he correctly noted in his article in VYSHKA K. Anikiyev, member of the coordination council on the problem of AHFP of the USSR Ministry of Geology, said that the disregard for the conducting of the necessary studies that often is manifest impairs the development of the depths of the earth, and in the final analysis, "cuts off that limb" on which the very tunneling plan is based.

By the way, one should note that in the discussion that unfolded on the pages of the newspaper, workers of the geological services mainly participated. Not a single leader of the drilling enterprise expressed his atti-

tude to the problem. Is this not the best testimony to the extent underestimation of the importance of conducting comprehensive geological-geophysical research on the depths of the earth.

In organizing a broad attack on the depths of the earth we must start from the fact that one cannot expect immediate benefit from the geological studies. The most important is to achieve a high final result. But this, of course, requires time. Gradually accumulating the necessary information we will be able at the subsequent stages of field development to drill wells faster and better, without accidents and complications, more efficiently reveal the new resources of natural fuel and place them in the service of the national economy.

Certain participants of the discussion, in particular, the prorector of the M. Azizbekov Azerbaijan Institute of Oil and Chemistry, Candidate of Geological-Mineralogical Sciences A. Kerimov, senior scientist of the AzNIPIneft' (Azerbaijan State Scientific Research and Planning Institute of the Oil Industry), Candidate of Sciences M. Kheirov, senior scientist, Candidate of Sciences V. Zil'berman from the UkrNIlgaz and others raise the question that to accelerate the exploration of new deep oil and gas deposits it is not mandatory to stipulate fulfillment of the entire complex of studies for each well drilled at the given field, but it is sufficient to have information on the first two or three so-called advance, development wells.

The raising of the question is correct in principle. From the results of studies conducted in the first wells one can prevent the drilling of surplus wells; it is more substantiated to select intervals of the section for detailed study (taking of a core sample, etc.). But at the same time it is impossible to forget that due to the insufficient degree of study of the sections in the first wells one can miss an oil-and-gas-bearing object or even not notice an entire field. Therefore great depths must not restrict the entire complex of geological and geophysical studies, the more so since they are stipulated by the plans for well construction.

In this respect the statement on the discussed problem by the engineer of the Neftechala iodine-bromine plant, Candidate of Geological and Mineralogical Sciences Kh. Bakhyshov is important. He correctly indicates that when it is said "know the depths of the earth better," then one has in mind first of all the oil and gas content of the beds, while in the depths of the earth there is an even greater quantity of different chemical components that can be used in the national economy with great benefit. Referring to the known legislation of the Soviet state on the protection and comprehensive use of the mineral resources he considers it necessary to precisely study the complete section of each exploratory well so that in addition to the oil-and-gas-bearing characteristics of the beds a complete description is also given of the chemical analyses of the deposit water. It cannot be said that the oil workers have ignored this aspect of the matter. However, it should be admitted that the comprehensive study of the deposit water has not yet been strongly set up, and in this sense the suggestion of Kh. Bakhyshov deserves every kind of attention.

The chief geologist of the Gobustan administration of drilling operations A. Shikhlin'skiy in his article "What Does Our Experience Teach" (VYSHKA for 8 September) suggests that in deep exploratory boreholes a geologist or technician-geologist be included in the drilling brigade; together with the senior geologist of the rayon engineering and technological service he would fulfill the necessary set of research work. This he sees as one of the main conditions for improving the efficiency of research.

It does not appear that the introduction into the staff of the drilling brigade of one staff unit of a geologist could guarantee the successful fulfillment of this task. Here it is necessary in the first place to accelerate the solution of the question on creating a harmonious system of continuous, rapid geological, geophysical and technological control over the making of deep and superdeep wells that is active in a number of other oil regions of the country. In the letter to the editorial staff the senior scientist of the AzNIPIneft', Candidate of Geological and Mineralogical Sciences R. Khachiyev, in particular, acquaints us with the experience of such control accumulated in the association "Belarus'neft'." Here each exploratory borehole is provided with a special laboratory (geological van-office) equipped with instruments and tools necessary for round-the-clock fulfillment of geological observations in the process of drilling the well. Such geological control permitted a saving of up to 400,000 R from 13 wells with completed drilling alone.

There is also important experience of organizing geological and geophysical control of the course of drilling wells and conducting research in them in other associations. Our task is to study this experience and imitate all that is valuable that can suit our working conditions.

A great reserve for improving the research in drilling is the increase in material interest of the workers in conducting it. As yet the economic levers in this area are very weak, and at times do not operate at all. The rewarding of the drilling brigades and leaders of the drilling organizations should be set in direct dependence on how high-quality the making of the well is, and how much the entire set of studies provided for by the plan for their construction has been fulfilled, the more so since currently geological and geophysical studies are implemented not only to solve geological tasks, but also to a greater degree to solve technological tasks.

In the near future the questions of improving the efficiency of geological and geophysical research in drilling will be passed for discussion of the association council with the broad participation of the production engineers and scientific workers. There once again a thorough analysis will be made of the discussion materials and specific measures will be planned whose fulfillment will make it possible to explore the oil and gas deposits with a higher yield than now.

FUELS

IMPROVEMENT IN TESTING SUGGESTED TO REDUCE OIL WELL CONSTRUCTION CYCLE

Baku VYSHKA in Russian 29 Mar 80 p 2

[Article by R. Ashurov, senior scientist of the laboratory of economics and organization of production of the scientific research and planning institute "Gipromorneftegaz": "When the Well Has Been Drilled"]

[Text] At the December (1979) Plenum of the Azerbaijan Communist Party Central Committee the unsatisfactory work of the offshore oil workers was correctly noted. Here it was stressed that in almost a year as a whole for the association "Kaspmorneftegazprom" 219,000 T of oil less than planned were extracted.

There are many reasons for this, and one of the chief is the slow rates of putting into operation of the new wells. For the sake of fairness one should note that the efforts for reduction of the cycle of their construction that are being undertaken are great. This is visible if but from the fact that last year as compared to the end of the Ninth Five-Year Plan the time for construction of one operational well in the sea was reduced by more than 40%, while the depth of the wells grew on the average during this time by more than 100 meters.

As a result of the shortening in the cycle of construction of offshore wells put into operation last year, from them an additional around 200,000 T of oil were obtained. The collectives of drillers have started to pay more attention to the testing of productive levels, and have increased their responsibility for the final result of their labor--the quality of the drilled well.

For the leading drilling brigades headed by Heroes of Socialist Labor M. Gambarov from the Sangachaly MURB [Offshore Administration of Exploratory Drilling] and I. Guseynov from the MURB "Neftyanyye Kamni," B. Akopov and T. Mustafayev from the MURB "Bulla" and many others the following has become an iron rule: the quality of your work is determined by the final results obtained during the testing of the wells. We note that this does not prevent them from attaining high rates of tunneling. Recently, for

example, from well No 39 drilled on the area of Bulla Sea by the brigade headed by T. Mustafayev a powerful fountain of gas condensate burst. Here the well was drilled almost a year ahead of schedule.

The fact that in accordance with the all-union statute, starting in 1977 the oil and gas wells over 3000 meters deep began to be considered finished by tunneling only after the drillers tested one productive level in them played its role in reducing the cycle of construction of wells.

From the results of the analysis conducted in our institute last year as compared to 1975 the segment of time from the end of drilling to the putting of the well into operation on the whole for the association "Kaspmorneftegazprom" was reduced on the average almost by 4 months. At the same time this reduction occurred mainly due to the decrease by more than 4-fold in the nonproductive outlays of time for elimination of accidents, defects, complications in testing the wells, etc.

But at the same time the importance of another factor rises, one that affects the cycle of construction of oil wells. I have in mind the almost double increase in productive time in testing. Here a definite role was played by the fact that the depths of the wells, as already noted, rose during the years of the 10th Five-Year Plan. Moreover, one needs to consider that over the years many offshore fields, like Peschanyy-more, Sangachaly-more, "Neftyanyye Kamni," and others "age" and the technology for testing the wells drilled on them is complicated. For example, they have started to use acid treatment more often for the critical zone in order to induce an influx of oil, as well as hydraulic explosions of the bed and other measures.

However, the effect of these objective factors on the growth in productivity of the cycle of well construction would nevertheless not be so great if the nonproductive standstills of the wells during testing were successfully curtailed. In no way can it be considered normal that now the period of well testing takes one-fifth of the total balance of time spent for their construction.

It is especially intolerable that here almost half of the time is spent in waiting for the testing and standstills due to organizational disagreements. It seems that the matter here is that the leaders of the offshore drilling organizations, in focussing primary attention on guaranteeing the fulfillment of the plan for tunneling, at times relegate to the background the testing of the drilled wells. Sometimes the necessary equipment and tools are delivered late. We figured out that even if the standstills in the offshore wells in waiting for testing were reduced by 20%, one could obtain from them during the year over 11,000 T of additional oil. There is no secret, moreover, that the working conditions, payment of labor, and production discipline in the brigades engaged in testing the wells are somewhat worse than for the drift miners. And there is nothing surprising in the fact that even after testing of the well begins the business suffers

from the great intrashift standstills linked to the shortage in the majority of brigades on testing of qualified workers, equipment, tools and so forth.

Whereas in the MURB "Nefyanyye Kamni" for example, in 1978 such delays comprised 2,620 hours, in 1979--already 3,849. In the Sangachaly MURB in 1979 nonproductive outlays of time comprised 5,500 hours, this is almost half of the time spent on drilling the wells.

And at the same time the escape from the situation is obvious. In the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Intensifying the Effect of the Economic Mechanism on an Increase in the Efficiency of Production and the Quality of Work" it is noted that one of the most important directions in improving all the planning work is the selection of the most efficient paths for attaining high final national economic results. Therefore the important index that should be planned must not be the number of meters drilled, but the number and quality of wells with completed construction and put into operation. Then the leaders of the drilling enterprises will have to pay no less attention to testing of the wells than their tunnelling, which indisputably will have a positive effect on the further reduction in the cycle of well construction.

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DANGARA-KURGAN-TYUBE OIL PIPELINE ADVANCES BY EFFICIENT BLASTING

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 25 Feb 80 p 1

[Article by assistant editor of the newspaper KURGAN-TYUBINSKAYA PRAVDA:
"We Glorify the Motherland with Labor. Route beyond the Clouds"]

[Text] In southern Tadzhikistan laying of the highest mountain oil pipeline in the country Dangara-Kurgan-Tyube is being completed. It extends 700 kilometers.

In the valleys of the republic the grass is already turning green, and here, on the mountain ridges there are snowdrifts as before. Explosions lift the snow into the air, mixing it with rocky ground, and the body of the mountain, slowly, meter by meter is cut by trenches. From two points, Dangara and Kurgan-Tyube the builders of the section of V. Ignat'yev are moving to meet each other, leaving a steel thread of the oil pipeline behind them.

They have already traversed eight roads, narrow-gauge and standard railroads, overcome an innumerable number of ravines, rapid mountain streams, and removed with explosions 130,000 cubic meters of rocky ground from their path.

The blasters are working excellently. Having set up a labor watch in honor of the 110th anniversary of the birth of V. I. Lenin they have fulfilled the 2-month program of this year in 1.5 weeks ahead of schedule. The head of the Tadzhik special administration of the trust "Soyuzvzryvprom" A. Anishchenko states that the collective has coped with the program of drilling and blasting at this facility 3 weeks earlier than the schedule required.

The complex brigade of assemblers of V. Movchan from the construction and assembly administration of the association "Tadzhikneft'" is not lagging behind the blasters. Its units are working efficiently and smoothly. The unit of V. Shul'gin founds and tests the lengths. The insulators of Z. Oli-mov that are fulfilling the shift assignments by 120-125% rival them in rate and quality of work.

It is not very simple to lay the oil pipeline at an altitude: each meter is not easily finished. But the builders know that now the oil is transported

to southern Tadzhikistan on a narrow-gauge railroad and its throughput is fairly low. Even today the narrow-gauge line barely copes with the volume of cargo, and in 2-3 years can be altogether "choked." That is why the oil pipeline is urgent and necessary. The cost of a ton of oil delivered to the south of the republic on it is 1.5-fold lower than with transporting in a railroad tank car.

The Dangara-Kurgan-Tyube oil pipeline under construction is essentially a continuation of the 50-kilometer oil pipeline from the field to Dangara. It was laid by the same collective of the section of V. Ignat'yev from the construction and assembly administration "Tadzhikneft'," so that the experience of working in high mountain conditions is not the occupation of the assemblers. Now there are over 20 wells operating at the field; before the end of the five-year plan their number will double. The new branch of the pipeline from here will become a reliable artery in the young Kurgan-Tyubinskaya oblast. And this in the most significant way will affect the further development of its economy. Thus today's advances (the oblast has been awarded the challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU and Komsomol Central Committee) will be multiplied.

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DEVELOPMENT, APPLICATION OF PIPELINE TRANSPORT

Moscow EKONOMIKA NEFTYANOY PROMYSHLENNOSTI in Russian No 2, Feb 80 pp 25-28

[Article by V. G. Dubinskiy, Giprotzuboprovod]

[Text] Development of purposeful complex scientific and technical, economic and social programs prior to the beginning of the next five-year plan was envisioned by the decree of the CPSU Central Committee and the USSR Council of Ministers "Improving planning and intensifying the effect of the economic mechanism on increasing production efficiency and work quality." One of them is the program for development and disposition of a unified transport system for the long term with regard to expansion of the sphere of application of major pipelines of all types and designations (in relationship with other types of transport).

Continuous development of the country's national economy provides for an increase of production and consumption of all types of products, which causes an increase of shipments and freight turnover of all types of transport, an increase and further branching of cargo flows on established lines and also discovery of new directions.

Freight flows are being organized by the unified transport system of the USSR which includes rail, pipeline, marine, river, motor and air transport.

A wide nomenclature of freight--pit coal, coke, petroleum and grain products, ferrous metals, ores, minerals, construction materials, mineral fertilizers and so on--are transported by rail, marine and river transport.

Shipments of petroleum goods by these types of transport are significant. Particularly, the specific weight of petroleum products in the total freight shipments by rail exceeded 10 percent. Railway transport hauls up to 90 percent of light petroleum products, all the mazuts, petroleum-based oils and other petroleum products. Significant volumes of petroleum products, especially light products, are delivered by rail over short distances with large expenditures of funds.

Solving the transport problem in the USSR under conditions of the rapidly developing national economy and a further increase in branching of various types of freight flows based on only traditional types of transport will be difficult. If the trend in future assimilation of all types of freight (and passenger) flows primarily by railway transport is maintained, development of new, wider railroad systems and more powerful rolling stock may be required during the next few years on the main lines, which is related to large capital and operating expenses and consumption of material and technical and labor resources.

Development of the unified transport system of the USSR should be accomplished on the basis of further development and expansion of scientific and technical progress. It should primarily provide the possibility of improving the use of the most progressive established types of transport and development of new improved and reliable transport facilities (permanent devices and rolling stock), operating under any climatic, topographical, geological and other natural geographic conditions and which require minimum capital investments, operating expenses and consumption of material and technical resources.

One of the links of the unified transport system is major pipeline transport, which is now primarily major oil pipelines, petroleum product pipelines and gas pipelines.

The system of major petroleum pipelines links the main oil-producing and oil-consuming centers of the country and is located in most economic regions and union republics. Oil is now delivered by pipeline transport on most directions of its flow. However, assimilation of these flows and pumping individual types and grades of oil over independent pipelines are not being provided.

The major petroleum product pipelines have been laid from a number of oil-refining sectors and in most cases do not bring the pumped petroleum products to the user, but transport them to tank depots located at the intersection of pipeline runs with other major transport routes where the petroleum products are transhipped to other types of transport for delivery to the points of consumption. Petroleum pipelines take only a small part of petroleum shipments from other types of transport and specifically from rail transport.

Pipeline transport not only is not at present making full delivery of oil and the wide variety of petroleum products produced by the petroleum refining plants, but is also not participating in assimilating the flows of other mass goods. Its capabilities are far from being used completely.

Moreover, this type of transport is distinguished by a number of positive qualities and very broad technical and economic capabilities, namely: any freight flows can be assimilated by major pipelines, they can be laid in all regions of the country by the shortest route, their operation does not

depend on climatic, natural and geographic conditions, the time of year and day and other factors, pumping different grades and types of goods can be done along a single pipeline, the major pipelines provide continuity and uniformity of delivery of goods, which creates conditions for continuous and reliable operation of the enterprises served by them, total automation and telemechanization of goods pumping processes are possible on pipelines, compared to other types of transport, major pipelines have better technical and economic indicators and shorter periods of construction and putting into operation and pipelines can deliver goods directly from the production points to the user.

Pipeline transport has been developed in the USSR on the basis of the general scheme of technical and economic justifications, projects and other operations developed for a long future period.

Two main related trends were noted in practical work on optimization of pipeline transport in the USSR:

--the first--optimization of development and expansion of the sphere of pipeline transport use;

--the second--optimization of the technical and economic decisions and measures on major pipelines, including optimization of routes, parameters, technical-economic indicators and so on.

Problems of implementing work on the first trend which should be the basic ones for the second trend of investigations carried out primarily for specific facilities are considered in the given investigation. Technical-economic justifications should be provided by investigations of the first trend:

1) prospects for development of pipeline transport to convert it to multiplan transport of different designation;

2) efficient disposition of pipeline transport of different designation throughout the country;

3) total assimilation of flows of petroleum products by major pipelines;

4) an increase of the variety of oil and other mass goods pumped through pipelines and specifically goods for delivery to the oil and gas industry and to construction of enterprises of these sectors of industry;

5) expansion of the sphere of use of pipeline transport and further specialization by types of petroleum and other products,

6) increasing the role of pipeline transport in the unified transport system of the USSR in shipments of petroleum and other types of mass products;

7) the effectiveness of capital investments in major pipeline transport.

The problem of rational development and disposition of the pipeline system should be solved by development of highly productive, branched and economical pipeline systems of all types and designations in the required scales which fully meet both the current and future needs for pumping a wide variety of mass products in all regions of the country. To realize it, construction of a full complex of facilities for new major pipelines of different designation which link the production points directly with the users, an increase of the capacity of previously constructed pipelines which have not achieved full productivity, replacement of some obsolescent pipelines with new ones, reconstruction and modernization of a number of major pipelines under operation with a justified increase of their capacity, development of finished capacity of major pipelines for subsequent periods of time, timely introduction of new pipelines into operation and an increase of the capacity of existing pipelines and creation of reserves of pipeline capacity, especially in future directions of the increase of product flows are required.

Along with an increase of the network capacity by construction of new pipelines, a universal increase of the degree of utilization of the capacity of both individual pipelines and of the operated major pipeline system of the country as a whole must be provided with provision of its maximum operating reliability, especially when full design productivity is achieved under severe conditions of route passage.

Further development of pipeline transport and an increase of its role in the unified transport system of the country should be carried out not only by increasing the length of its system, but also by increasing the level and extent of scientific and technical progress which should be directed toward improving pumping equipment and technology, conversion of pipeline transport into a standardized system, highly economical type of transport of a wide variety of national economic goods, development of new progressive directions, forms and production processes for moving goods over major pipelines which provide an increase of the nomenclature and variety of pumped goods, expansion of the sphere of using pipeline transport in the national economy, specialization of major pipelines, provision of the capability of using optimum parameters and design of pipelines, highly productive equipment and fittings, complete equipping of pipelines with means of automation and telematics and a control system, extensive use of industrial methods of construction of the line part and pumping stations, an increase of the pipeline load with a simultaneous and maximum increase of their operating reliability, simplification of the transport production process, provision of continuous delivery of products with maximum approach to the transport-production point-direct to consumer scheme, reducing to a minimum operations on loading products at production points on movable transport facilities and reception at user points and so on.

Expansion of the sphere of use of pipeline transport requires strict specialization of pipelines, which should be established on the basis of technical and economic justifications with regard to flows of various types of goods and the most economical sphere of using each type of transport for assimilation of them. The following specialization of individual types of major pipelines of certain designation is possible at first. Oil can be pumped through major pipelines from the production sites to the petroleum refining plants and points of shipping it for export, with the exception of heavy oil and some quantities of all types of oil, of which their quality cannot be maintained or the quality of other oil cannot be maintained if sequential pumping over a single pipeline is required.

Delivery of a wider variety of petroleum products than at present and in total volume is possible over major petroleum pipelines, namely: gasoline, diesel fuel, kerosene, heating oil and naval mazut and petroleum-based oils.

Liquid carbon dioxide, gas condensate, ammonia, ethylene, the wide fraction of light hydrocarbons and other products of the chemical, petroleum refining and petrochemical and gas industries can be transported over major chemical pipelines.

Delivery of heavy and other oil, various types and grades of petroleum and chemical products, pumping of which directly over major pipelines of corresponding designation is unprofitable, gas in the form of crystal-hydrates and also coal and coke, agricultural products, mineral construction materials, mineral fertilizers, postal dispatches and so on can be supported by pipeline container systems. The pipeline materials designed for other types of products of various sectors of the national economy can be specialized in delivery of the corresponding goods. Flows of the goods indicated above are branched type, coincide in many directions, reach significant volumes and provide the possibility of developing pipeline systems of great length and economy.

The possibility of using major pipelines to deliver a wide variety of a practically unlimited volume of mass goods requires solution of the important problem--working out the main directions for further optimum development and disposition of the unified transport system of the USSR with regard to the widest economic sphere of using major pipelines of different type and designation and also of rail, water and motor transport to assimilate the flows of petroleum products and other mass goods.

Compilation of a complex purposeful program for development and disposition of the unified transport system for the long-term is feasible for this, with development and determination of the entire complex of related problems on major pipelines of all types and designations in it and rail, maritime, river and motor transport separately and in the unified transport system as a whole.

This work should be carried out by head planning and scientific research institutes for a particular sector of industry and should contain optimum, objective and real recommendations for adoption of them as a basis when compiling plans for development of the national economy.

Expansion of the sphere of using specialized pipeline transport, bringing in an ever wider variety of mass goods for pumping through pipelines and development of a branched network of major pipelines of different type and designation throughout the country will contribute to continuity and uniformity of accomplishing the transport process, to reduction of national economic delays in transport of products and to releasing other types of transport and especially rail transport for passenger transport and assimilation of rational product flows for each of them.

Compilation of a complex specific program for development and disposition of the unified transport system is one of the steps of investigations and practical implementation of the measures and recommendations developed in it is required. This should be provided by including these measures in the national economic plan, allocation of the required monetary and material resources, construction and installation organizations and so on. All the measures cannot be implemented simultaneously and universally. Therefore, all the measures and monetary and material resources must be distributed by priority and periods of time with regard to their direction primarily toward increasing the capacity of transport on sections with an absence of reserves and creation of transport communications in new regions of development and disposition of productive forces.

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